THE

VVell spryng of sciences, whiche
teacheth the perfecte woorke
and practise of Arithmeticke, bothe
in whole nombers and fractions,
with suche easie and compendious in-
struction into the said Arte, as
hath not heretofore been b
any sette out nor
laboured.
Beautified with moste necessary rules
and questions, not onely profitable
for Marchauntes, but also for
all Artificers, as in the
Table doeth partlie
appere: set forthe
by *Humfrey*
Baker
Citezeine of
Lōdon.

¶ *Imprinted at London, by Ihon Kyng-
ston, for Iames Rowbothum.*
M.D.LXVIII.

24 Julij 1594

Pum Johannis Walkeden

Also uber pretendt
Gerd wol in mieden
ad Johannem cook
volh costens und kein
ab omnibus malis
Christ kein dofoed
ad vickem ottzmann
[illegible] nichent und

¶ TO THE RIGHTE

Worſhipfull Maiſter Ihon Fitz-

williams Gouernour of the moſt famous ſocietie of Marchauntes Aduenturers into *Flaunders*. *And to the righte VVorſhipfull the Conſuls, Aſſiſtens, and comminaltie of the ſame ſocietie, Humfrey Baker wiſheth health with continuall increaſe of commoditie by their worthie trauaile.*

ALthough heretofore (right worſhipfull) diuers and ſundrye well ſkilled men in ỹ ſcate, and ſcience of numbrynge, haue not ſpared their labour, not onelie in beatifyng, but alſo in augmentyng the ſame with ſuch increaſe of witte, as hath exceedingly contained the ſtudientes therein, and made them riper, in the crafte knowledge and redineſſe of it. Yet becauſe an arte can not haue to muche ſetting furthe, neither can be to muche commended, I (amonge, and after ſo many

pregnaunt wittes)am bolde to putte forthe the fruicte of my blunt vnderſtandyng and trauaile, in the like ſcience, not correctyng or reprouyng any mans former edition, but makyng an attempte of my groſſe, and meane ſtudie herein, to the entent that thys my enterpriſe maye (by other mennes doinges) bee either gentlie amended, or frendlie receiued. And becauſe I deſire ſpecialle that it may bee gratfullie accepted, I haue choſen you (worſhipful) to be as defendours of this little incubration, to whom I knowe it ſhall bee welcome, not ſo muche for my ſake, as for the ſcience loue it ſelfe, wherin it is wel knowen you haue ripe iudgement and good vnderſtandyng, as by youre daylie exerciſes it maie appeare. And although ſome foliſhe heades of fanſie ouerthwart, thinke this Arithmetical art peculier onely to a fewe, vſyng the trade of marchaundiſe, as though it were not ſo neceſſarie for other men: yet I am ſure, the wiſeſt and beſt learned

ned perceiuyng the wonderfull art, the depe diuiſes, and the cunnyng concluſions that are compꝛiſed in it: affirme it (that of right) to bee the beſte whetſtone, oꝛ ſharpnyng of the witte of euerie man that euer was inuented, & thinke it moſt neceſſary to be taught vnto childꝛen, without the whiche, nothinge either pꝛiuate oꝛ common can bee well oꝛdered. And true it is, that whoſoeuer is ignoꝛant of this ſcience of numbꝛing, he ſeeth in all the reſte and lacketh that pꝛomptitude of witt, whiche other haue in caſtynge and accomptynge of greate ſummes. Yea, I ſaie he that hath the exact knowledge of it, hath a ſpeciall gift of God, and caꝛieth about hym a note and token of a good witte: and I doubt whether euer any was counted oꝛ eſteemed ſimple oꝛ foliſhe, that had this ſcience in his head. Nowe if ſome curiours bꝛaine would aſke me this queſtion: ſir you cõmende much your art of numbering, can you tell who was the firſte inuentoꝛ of it, oꝛ

what this worde Arithmetica doth ſignifie, I would anſwere hym that it is vncertaine who inuented it firſte, but well I knowe, it is one of the ſeuen liberal ſciences: which, if I ſay god gaue vnto man to adourne his life with all, I ſaie as it is, & as wee ought to beleue of whom we acknowledge to haue receiued them & not of the Poetes, or heathen gods, as ſome ſchole men wil ſay. Moreouer, I knowe that Abraham taught it firſt vnto the Egiptians, and no man wil denie but that he receiued all his knowledge of god for he worſhipped no ſtraunge gods neither receiued any giftes or ſciences of them. And although many yeres after, Pythagoras declared it to the Grekes, yet was not he the firſte inuentor of it, but god. Plato alſo commended it as moſt neceſſarie, willinge it to be taught to all youth before all other thinges. And thankes be to god, it appeareth that his precept hath been very well folowed here in Englande, for I finde not in any

my nation (I ſpeake not flatering my countrey men but commending them) more ready knowledge in this ſcience, then there is in the moſte parte of our youth here in Englande, and namely in London, whiche I ſeeyng it is in them, it is (out of queſtion) in their maſters and tutours, whiche by their greate care ouer theim, haue trained theim vp vnto the practiſe thereof, to whom the greateſte parte of the praiſe redoundeth. And nowe right worſhipfull, when I conſider how little profite my ſimple trauaill ſhall bryng, beyng but as it were an aſſaye of further attempt, I am cõpelled to craue at your handes onely to accepte my good will with the worke: for will & abilitie are somewhat vnequall in me, but if abilitie were correſpõdent to will, I would gladly pleaſure you in greater thinges then this is, whiche is but a ſhadowe in comparison of other mẽnes ſubſtanciall labour and trauail in this art: yet I truſte it is not altogether ſo vnpoliſhed,

ſhed, but it hath paſſed vnder the file of ſome workemanſhippe, wherby ſome men maye take occaſion of profit and furtherance herein, which is my chiefe deſire, although I knowe many are able to do better: for England is not ſo deſtitute of learned heades, but my doinges may ſone be followed, yea rather amended. But yet forasmuche as I would that ſhould knowe, that knowe not, I thought it not good to hide that which hath been opened vnto me. And ſo caſting with my ſelf the ſōme of all, I deſire you eſtſones, right worſhipful (to whome I thought it moſte mete to preſent the fruicte of my ſtudie) thankefully to receiue it, as your wonted wiſedomes doth all thinges well and beſtmoſtlie purpoſed.

Thus fare you well, deſiryng God to maintaine you in youre eſtate, to proſpere & further all your traffickes and voyages, encreaſe you in vertue, and keepe you in good health. Amen.

THE DIFFINITION

of Nomber.

NOmber is as much to say, as a multitude compound of manye vnityes, as two is compounde of two vnities, three is compounde of three vnities, foure of foure vnities, fyue of fyue vnities ten of ten, fourtene of fourtene, fyftene of fyftene, twentie of twentie vnities, &c.

And therefore an vnitie is no nomber, but the beginninge and originall of number, as yf you doe multiplye or deuide an vnitie by it selfe, it is resolued into it selfe without increase. But it is in nomber otherwise, for there can be no nomber, howe great so euer it bee, but that it maye continuallye be encreased by addynge euermore one vnitie vnto the same.

Numeration. Cap. i.

Numeration is the art wher-by to expresse and declare the value of any summe proposed, and is of two kyndes, the one gathereth ỹ value of a sum proposed, & the other expresseth anye summe conceyved by due figures and places, for the value is one thinge, and the figures are another thynge: and that cõmeth partlye by the diuersitye of fygures, but chiefelye of the places wherein they be orderlye set. And fyrste marke, that there are but ten fygures or characters whiche are vsed in Arithmeticke, wherof nine of them are called signifyynge fygures, and the tenth is called a cypher, whiche is made lyke an o. and of it selfe signifieth nothinge, but it beynge ioyned with any of the other figures, encreaseth their value, and these be they.

1	2	3	4	5
one.	two.	thre.	four.	fyue.
6	7	8	9.	
syre.	seuen,	eyght.	nyne.	

Also

Alſo you ſhal vnderſtande that euery one of theſe fygures hath two values: One is alwaye certaine and hathe his ſignification of his owne forme, and the other is vncertayne whiche he taketh of his place.

A place is called the ſeate or roome that a figure ſtandeth in, and howe many fygures ſo euer are written in one ſumme, ſo many places hathe the whole value thereof. And that is called the firſte place (whiche nerte is towarde the ryghte hande) of anye ſumme, and ſo reckenynge by order towarde the lefte hande, ſo that, that place is laſte whiche is nerte the lefte hande. And contrarywiſe, when you expreſſe the value of the fygures in anye ſumme you muſte begynne at the lefte hande, and ſo recken towarde the ryght hande.

Euerye of theſe nine fygures, (whiche are called ſignifyinge fygures) hath hys owne ſimple va-

lew when he is founde alone, or in the fyrſte place of anye ſume. In the ſeconde place towarde the lefte hande, he betokeneth his one valewe ten times. As .70. is, ſeuen times ten: that is to ſaye ſeuentie, 80. is viii. times ten: that is to ſaye eyghtie. In the thirde place euery fygure betokeneth his owne valew a hundreth times. As. 700. in that thirde place betokeneth, a hundreth tymes. 7. that is to ſaye, ſeuen hundred: In the fourthe place euerye fygure betokeneth hys owne valew a thouſande times. As. 7000. is ſeuen thouſande, and 8000. is eyghte thouſande. Theſe foure fyrſte places muſte be had perfectlye in minde, ye and that by harte, for by the knowledge of them you maye expreſſe all kinde of nombres howe great ſo euer they be.

In the fyfte place euery figure betokeneth his owne valewe tenne thouſande times. As 70000. is ten tymes ſeauen thouſande, that is to

ſaye

laye ſeauentie thouſand: In the fyrſte place euerye fygure ſtandeth for his owne value, a hundreth thouſande tymes. As 700000, is ſeauen hundreth thouſande. The vii. place a M. M. times, or a million: as 7000000, is vii. M. M. or vii. millions. And the viii. place. x. M. M. times, or ten millions, ſo that euery place towarde the lefte hande, exceedeth the former ten times. But nowe for the eaſye readynge, and redye expreſſynge orderlye of anye ſumme propoſed you ſhall practiſe this maner, folowing. And for example I propone this nomber 76541268. in the whiche are nine places. In the fyrſte place is 8. and betokeneth, but eyghte, in the ſeconde place is 6. and betokeneth, x. times ſyxe that is ſyxte, in the thirde place is fyue, and betokeneth a. C. tymes fyue, that is. vi. C. In the fourthe place is. 2. and that is twoo. M. And 3. in the fyfte places is x. M. tymes 3. that is xxx. M. So 4. in the ſyxte

B.iij. place

place is a C. thousand times. 4. that is .iiii. C. M. then fyue in the seuenth place is a. M. M. times 5. that is v. M. or rather 5. millyons. And 6. in the viii. place is. vi. times x. millions, that is lx. millions. And laste of all. vii. in the. ix place, is vii. C. millions now followeth the practise. Fyrste put a prick ouer the fourthe fygure, and so ouer the seuenthe, and lykewyse ouer the tenthe. And also ouer the 13, 16. or 19 if you had so many, and so stil leauinge twoo fygures betwene euerye twoo prickes and those roomes from one pricke to an other are called ternaries, then you muste pronounce euery thres fygures from one pricke to an other as though they were written alone from the reste. And at the ende of theyr valewe, adde so manye tymes thousande, as your nomber hathe prickes (that is to saye, yf there be but 1. pricke, it is but one M. yf two prickes a M. M. or els a million yf 3. prickes a. M. M. M. or a M.

million

millyon, and so consequentlye of all other fygures folowynge.) Then come lykewyse to the nexte three fygures, and sounde them as yf they were sparte from the reste, and adde to their valewe so manye tymes thousandes as there are pryckes betweene them and the fyrst place of your whole nomber. And so do by they next three fygures folowyng and of all the reste likewise as in exãple. 451234678567. The fyrste pricke is ouer. 8. in the fourth place, whiche is the place of a. M. the seconde pricke is ouer 4. in the vii. place, whiche is the place of a M.M. or one million, the third pricke is ouer the. x. place whiche is the place of a M. M. M. or of a M. million, as in the former example. Then for the expressynge of this nomber by the valewe of euerye fygure, accordynge to the place wherin they stande, you shall fyrste begynne at the laste pricke ouer one, and take yt and the other twoo fygures. 5. and. 4.

whiche do folowe him & valew them alone and they are iiij. C li. MMM. or els CCCC li. M. millions. Then take the other iij. fygures from one to the nerte pricke, and valewe them as if they were a parte from the other, and they are. 234. which are. CCxxxiiij. million, or 234. MM. Then come to the thyrde pricke ouer 8. and take the other ii. fygures behinde it, and recken them lykewyse as yf they were alone, and they are vi C lxxviii. M. And laste of all come to the other twoo fygures whiche remaine, that is. 567. and they are fyue Clxvii. Thus the whole sume of these fygures, is iiii. Cli. M. ii Cxxxiiii. Millions, viC. lxxviii. M. vClxvii, as before.

hre kindes of nmbers.

Note also that whole nomber is deuided into three kindes, that is to saye, diget nomber, article, and mixte or compounde nomber. The

Diget.

dyget nomber, is all maner of nombres vnder. 10. whiche are these. 9. fygures

fygures 123456789. of the whiche I haue ſpoken beſoꝛe. The Article nom ber is anye kinde whiche beginneth wyth a cyphar as this. o. and they maye euer be deuided Juſte by. 10. without anye remayne as theſe. 10. 20. 30. 40. 50. 100. and all other ſu che like. The mirte, oꝛ compounde nomber, conteineth diuers and ma ny articles, oꝛ at the leſt one article, and a diget, as. 11. 12. 16. 19. 22. 38. 108. 1007. and ſo foꝛthe. And as any article nomber maye be made a compounde, by puttynge ther to a diget, euen ſo lykewiſe euery compounde nom ber, may be made an article nomber by addinge ther vnto a o.

Article.

Mixte or com pounde.

And

¶ And here followeth a briefe rehersall of the order and Denominatours of the places. And this shalbe sufficient for Numeration.

The order of the places.	Tenth.	Nynth.	Eyghth.	Seuenth.	Sixte.	Fyfthe.	Fourth.	Thyrde.	Seconde.	Fyrste.
	4	3	2	1	0	1	8	3	4	5
The denominatours of the places.	M. of millions.	C. of millions.	X. of millions.	M. of millions.	C. of Thousandes.	X. Thousandes.	M. Thousandes.	Hundreths.	Tenthes.	Vnities.

Addition

Addition in whole nomber

Chap. 2.

ADdicion is as muche as to bringe together twoo ſummes or more into one, as if there were due to anye man 223. li. by ſome one body, and 334. li. by another, and 431. by another, & you woulde knowe howe many pound is due to the ſame man in all, theſe iii. ſummes ſhall you ſet downe orderly the one vnder the other, writinge the greateſt ſummie highest and the nexte to the greateſt vnder it, and the leaſt ſum vnder the laſte, in ſuche ſorte that the firſte figure of the one ſūme by directly vnder the firſte figure of the other, and the seconde vnder the seconde, and ſo furth in order, when you haue thus done drawe vnder them a ſtraight line, & then wyll they ſtande thus.

4	3	1
3	3	4
2	2	3

Nowe begynne alwayes at the fyrſte places towarde youre ryghte hande, and put together the

the. iii. firſte figures of theſe. iii. ſummes, and looke what commeth of them, write that vnder thē beneath the lyne, as in ſayinge. 3. 4. and 1. beinge put together do make 8. write 8. vnder. 3. as thus.

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431
334
223
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  8
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And then go to the ſecond figures and doe likewiſe: as in ſayinge. 2. 3. and 3. maketh 8. write 8. vnder. 2. as here you ſee.

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431
334
223
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 88
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And lykewiſe doe wyth the fygures that be in the thirde place, in ſayinge. 2. 3. and 4. are. 9. put. 9. vnder them and ſo wyll your whole ſumm appeare thus: whereby you maye perceyue that thoſe three ſummes beyng added together do make 988 li. and this is ỹ art of addicion accordinge to his ſimplicitye, if the ſum of anye place doe not excede a diget nomber. But in caſe the ſumm of anye one place can not be expreſſed by

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431
334
223
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988
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by one figure but by two you shal put the fyrste of those figures vnder the line, and kepe the other in your minde for to adde it vnto the firste figure of the nexte place. And if the same nexte place can not be aualued but by two fygures, you muste in lyke maner put the fyrste of those fygures vnder the lyne, and reserue the second for the other place nexte after, and thus must you do from one place to another vntyll you haue come to the laste place, where in case you doe fynde that the summe be of twoo fygures, you muste set them both downe because it is the ende of that woorke, as in this example.

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 734682456
 450932345
  13467891
   4672123
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1203754815
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Where

where the firſte figures are, 3. 1. 5. 6. whiche added togither maketh 15. and for that, that 15. is of twoo figures, I do put the firſte fygure 5. vnder the line, and kepe the ſeconde fygure (which is. 1) in my minde, the whiche I muſte adde with the nexte fygures of the ſeconde place, that is to ſaye with 2. 9. 4. and. 5. the whiche togither make 21. I wzitte 1. vnder the line for the ſeconde fygure of that addition, that is to ſaye after. 5. & I kepe 2. to be added vnto the third place the whyche wyth the other fygures 1. 8. 3. 4. do make 18. therefoze I put. 8. nexte after. 1. in the third place vnder the line, and kepe 1. to be added vnto the fygures of the fourth place, whiche is with 2. 7. 2. 2. the whiche with the 1. that I kepe doe make 14. I ſet downe 4. for the fourth fygure (vnder the line) that is to ſaye, after 8. and I kepe 1. to be added vnto the fygures of the fyfte place, the whiche is 7. 6. 3. 8. with the 1. that I kepe

maketh

maketh. 25. I put. in the fyrſte place vnder the line nexte after, 4. and kepe 2. in mynde to be added wyth the fygures of the ſyxte place, that is with 6. 4. 9. 6. and that 2. whiche I kepe, maketh 27. I write downe 7. vnder the line in the ſyxte place, and I kepe 2. whiche I adde wyth the fygures in the ſeuenth place, and they make 13. I put downe 3. vnder the lyne in the ſeuenth place, and adde 1. vnto the fygures in the eyght place and they are 10. I doe put 0. vnder the lyne in the eyghte place, and then I adde 1. vnto the nynethe place, that is to ſaye with 4.7. and they make 12. the whiche 12. I writte at length vnder the lyne beeauſe it is the ende of this addition, and this is to be done of all ſuche lyke. And for the eaſyer vnderſtandinge of that whiche we haue ſpoken of addition, you may eramen theſe two other eraimples folowinge, in the whiche the fyrſte hath theſe nombers. 3570. 2763. 579. 28.

which

whiche beinge added toghther doe make this nomber 6940, and in the seconde example dothe resolute this nomber 51683. by addynge together of these nombers, 47630. 3756, 2722, 25, as here vnder wzitten.

The nombers to be added.				
	3570,	47630		
	2763		3756	
	579		2722	
The line put betwene.	28		25	
The summe of this addition.	6940		51683	

¶Of ſubſtraction in whole nomber. chap. 3.

Subſtraction teacheth howe you ſhal abate one leſſer nomber from a greater, and what there doth remaine after that you ſhall haue abated the ſame, I ſpeake not of the abating of one egall nomber, from an other egall vnto it, for the facilitie therof requireth no Rule.

In ſubſtraction are founde three nombers, the one is that, from the whiche the ſubſtraction is made. The ſeconde is the nomber, that is to be ſubſtracted, and the thirde is the nomber whiche remaineth after the ſubſtraction is ended. As when I woulde ſubſtract. 25. from 40. The 40. is the nomber from the which the ſubſtraction is made, 25. is the nombre to be ſubſtracted, and. 15. is the nomber whiche remaineth after you haue done the ſubſtraction, here foloweth the practiſe. You ſhall put the leſſer nōber vnder the greater in ſuch

ſorte, that euerye figure of the one numbre maye aunſwere vnto euerye fygure of the other ordrlye, and then drawe a right lyne vnder thoſe twoo numbers, as you dyd in Addition. Then muſte you beginne at the right hande and take the fyrſte figure of the vndermoſte number, and abate that from the firſt figure of the vppermoſt numbre, and that whiche remaineth you muſte ſet vnderneth the line right vnder that figure whiche you haue ſubſtracted. Then afterwarde take likewiſe the ſeconde figure of the neithermoſte numbre, and abate that alſo from the ſeconde fygure of the higher numbre. The thirde from the thirde, and ſoe fourth of all the reſte tyll you come to the ende, puttynge alwayes the remaine of euerye fygure vnder the line in hys order, example. I will ſubſtracte 2345. from 9876. after that I haue put them doune accordynge to the maner aforeſaied.

9876	
2345	
7531	

remayned. I take firſte .5. from .6. and there reſteth .1. the whiche I ſette vnder the lyne right againſte .5. Secondlye I abate .4. from .7. and there reſteth .3. the whiche I ſet in the ſeconde place vnder the lyne, nexte after .1. Thirdly, I abate .3. from .8. and there reſteth .5. The whiche I put vnder the line in the thirde place, finallye I doe abate .2. from .9. and there reſteth .7. the whiche I putte vnder the lyne in the fourth and laſte place, and thus is this ſubſtraction ended, by the whiche there reſteth .7 5 3.

But when twoo fygures of one likenes doe chaunce to meete, ſo that the one muſte bee abated from the other, as if I ſhoulde abate ſeuen from ſeuen, there remaineth nothyng, and then muſte I ſet a ciphre .0. vnder the line. But when the figure whiche is to bee abated, dothe exceede the figure whiche is ouer hym, ſo that it can not be taken out of the ſame figure. Then muſte you abate the neather fygure

from, 10. And that whiche doth remain you shall adde vnto the same figure whiche is vppermost. And the sum whiche commeth therof shall you set vnder the line. But when so euer you do borow any such .10. of the ouer nomber: you muste adde .1. vnto the nexte neather figure folowynge whiche is to bee abated. And there is nothinge elles to be done in substraction. Example I will substract 93576. from. 4037479. after that I haue placed my two nombers, as I ought to do, I do fyrst.

4037479
 93576
3943903

Abate .6. from 9. and there resteth .3. then I put the 3. vnder the line right against .6. And secondlye, I abate .7. from 7. And there resteth nothinge. I doe put a cipher. 0. vnder the line right againste. 7. in the seconde place. Then I come to the thirde place where I finde .5. whiche I cannot abate from the figure ouer hym whiche is but 4. ther-

4. therfore I do abate it from 10. as
before I taught, and there reſteth. 5.
the whiche I doe adde, wyth the. 4.
whiche is ouer hym, and that ma-
keth. 9. I put 9. in thirde place vnder
the line for the thirde fygure, fourth-
lye for the. 10. whiche I borowed I
adde one vnto the nerte neather fy-
gure whiche is 3. and they make 4. the
whiche I doe abate from the ouer fy-
gure. 7. and there reſteth 3. I put. 3.
vnder the lyne for the fourth fygure.
And then I come to the fyfte place
where I do fynde 9. whiche I cannot
abate from the fygure ouer hym
whiche is but. 3. but I abate 9. from
10. and there reſteth. 1. the whiche I
do adde with 3. and they make, 4. I
put. 4. vnder the lyne for the fyfte
fygure. And if it were not, for that
I did laſte borowe. 10. the ſubſtrac-
tion ſhoulde haue bene ended. But
for bycauſe that I muſte (for euer-
lye ſuche tenne that I borowe) al-
wayes adde. 1. vnto the nerte nea-

ther figure folowyng, I muste therefore proceade vnto the subtraction. And for that, that there is not other figure folowyng in the nether number, it shall suffice to haue kepte the vnitee, and to abate it from the nerte ouer figure. But I find there. 0. and I cannot abate. 1. from. 0. therefore I abate it from. 10. and there resteth nine whiche I doe putte vnder the lyne in the firte place, synallis for the tenthe, which I borowed, I keepe. 1. in mind. The whiche I doe abate from. 4. and there remaineth thre, the whiche I doe putte vnder the lyne in the seauenth place after nine. And the operation is thus ended.

¶ Another Example.

576084026
485675437
90408589

But if there were many numbers to be subtracted from one numbre alone, then muste you firste adde those numbers together according vnto the doctrine

doctrine of the chapitre goyng before, and then to make your substraction as aboue saied. As if I would abate these thre summes. 123.234.456.frō.98925 first I do adde the.3 summes into one and thei are 813. The which I do abate from 98925. and there resteth 98112.

¶ Of multiplication.

Chapiter. 4.

IN multiplication there are thre numbers to bee noted, that is to saie the numbre whiche is to bee multiplied, the whiche wee will call the multiplicande: and the numbre by the whiche we multiplie, we call the multiplier, or multiplicator. And the third numbre is that which commeth of the multiplication of the one by the other, which is called the product. As when I would knowe how much moūteth. 10. multiplied by 9. ẏ is to saie how much are. 10. tymes 9. I find that thei ar worth 90. thā 10. is the multiplicād. 9. is the multipter.

And 90. is called the produce: Then for to multiplye, is none other thinge, but to fynde a nombre whiche conteineth the multiplicande so many tymes, as the multiplyer conteineth vnities. As 10. multiplyed by 9. do make 90. as before said. And 90. conteyneth 10. so manye tymes, as 9. conteineth vnities, that is to saye nyne times.

In multiplycation, it forceth not muche whiche of the twoo nombers by the multiplicande, nor whiche be the multiplier. For 10. multiplyed by 9. maketh as manye as 9. multiplied by. 10. yet nevertheles it shalbe more commodious that the lesser nombre be alwayes the multiplier.

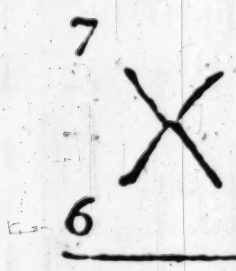
And for that, that the multiplication of fygures the one by the other, is the moste chiefe and necessaryest kynde, whereby to knowe howe to worke in the multiplication of compounde nombers, and that euery man hath it not at the fingers ende.

ende: I wyll therfore gyue you beare certein easye wayes of multiplication of diget nombers. When you woulde multiplye twoo simple fygures, or digits the one by the other, abate eche of those diget nombers from 10. Then multiplye the twoo remaines the one by the other. And if the summe doe excede 10. writte onely the firste fygure, and kepe the other to be added to the nexte operation, whiche is thus. Adde your two simple figures together: And of the which resulteth of that addicion, take onelye the fyrste fygure, vnto the whiche you muste adde the vnitye whiche you kept before. And that shalbe the seconde fygure of the summe which you do seeke. Example, I woulde multiply 7. by 6. I take 7. from 10. and there resteth 3. likewise I abate 6. from 10. & there resteth 4. then I saye thus 3. times 4. make 12. I writte 2. for my firste fygure, & I kepe 1. in my minde, then I adde 6. with 7. and they are 13. of the which

whiche I caste awaie the seconde figure. 1. and I take onelie the firste fygure. 3. vnto the whiche I adde the vnitie whiche I kepte, and they make 4. whiche I wryte in the seconde place after. 2. And thus I finde. 42. whiche is the valuer of 7. multiplied by. 6.

Otherwise, and all commeth to one effecte, sette downe youre two digitte numbers the one right ouer the other, and right against euery of them towarde the right hande wryte hys owne distaunce from. 10. Then multiplie the two differences together, the figure whiche commeth thereof, shall you set doune vnder both the differences. But if there be two fygures sette doune but the fyrste, and keepe the other in youre mynde, afterwardes abate (from one of the two digit numbers) the difference of the other digitte number that is to saie, croswise. And vnto the remayne adde the fygure whiche you kepte, and that shall bee the

the seconde nomber, and thus you shall haue your multiplication. Exãple of the like figures, that is to saie, of 7. multiplied by .6. the distaunce of .7. vnto .10. is .3. And the distaunce of .6. from .10. is .4. I sette them doune crosselwaies, as you see: And then I saie .3. tymes .4. are .12. I sette doune .2. and keepe one in my mynde, then I abate .4. from .7. or els .3. from .6. it forceth not from whiche of theim: and there resteth alwaies .3. vnto the whiche I adde the vnitie, whiche I kepte in my mynde, and thei are fower; whiche shall bee the seconde figure of the multiplication. And thus I finde that seuen, multiplied by fire, maketh fowertie and twoo, as in the other operation. This practise hath no place where the twoo digette noumbers (dooe not exceade tenne) by addyng theim together, and then is multipli-



multiplication eaſye ynoughe without any rule.

An other waye to knowe the multiplication of ſymple numbers, is by this table folowyng: the vſe whereof is thus.

Fyrſte you ſhall vnderſtande, that the nombers from 1. and ſo downewardes to 9. ſet in the left part of hangyng margin of this table do betoken the multipliers of all ſimple nombers. And the elements of fygures beyng put bigheſt in euery ſquare rome drawynge towarde youre ryght hande right againſt euery of the multipliers, doe ſignifie, the multiplicands, vnto the multipliers of the hangyng margin. And the lower or inferiour nombers in euerye ſquare roome, do betoken the product of that multiplication, which is made in multiplyinge the vpper nomber ouer it, wyth the figure in the hanging margin, anſwering directly vnto the ſayd ſquare: as by example.

The

THE TABL
THE TABLE OF

multiplication by all the diget nombers.

times	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36	42	48	54
7	7	14	21	28	35	42	49	56	63
8	8	16	24	32	40	48	56	64	72
9	9	18	27	36	45	54	63	72	81

Firſte, becauſe one doeth not multiplie, I ſette in the vpper margin the figures from. 1. to. 9. bothe in the hier and alſo in the inferiour rowes, for one in the hangyng margine, multiplied by one the vpper nomber in the firſte ſquare bryngeth but one, ſo likewiſe twoo beyng the higher nomber in the ſeconde ſquare of the vpper margine, multiplied by. 1. in the hangyng margine, bryngeth twoo for the lower nõber in the ſeconde ſquare of the vpper margine, for one tymes one maketh but one, and one tymes twoo maketh twoo, then one tymes three maketh. 3. and one tymes fower maketh fower, and ſo continewyng toward the right hande, vntill you come to the figure of 9. whiche is one tymes. 9. maketh. 9. Then after multiplie twoo of the hangyng margine by twoo, the vpper nõber of the ſquare, nexte towarde the right hande, and that maketh fower, whiche is the producte of twoo, multiplied by twoo, whiche fower is ſet vn-

der

bee the twoo, for twoo times twoo are fowee, and twoo tymes thre maketh sixe, then twoo tymes fower maketh 8. and twoo tymes. 5. maketh. 10. and so continewyng vnto twoo tymes. 9. whiche maketh. 18. The like is to bee doen with the thirde rowe, and so likewise of all the residue.

Example, I would knowe what is the producte of. 9. multiplied by. 8. I seke in the hangyng margin the multiplier eight, and emongest the squares directly againste eight, drawyng toward the right hande, I seke the multiplicande. 9. in the higher rowe, and I finde the producte right vnder. 9. to bee. 72. Then. 72. is the nomber which commeth of the multiplication of. 9. by eight, and so is to bee vnderstande of all the reste of the table, whiche table muste bee of all menne learned by harte, or as thei saie without booke, whiche beyng learned, you shall the better attaine to the reste of multiplication.

To come nowe vnto the practise of multiplication, when you woulde multiplye twoo nombers, the one by the other, you muste set them downe after the same maner as you dyd in addition, and in substraction. That is to saye, the first fygure of the multipliter, vnder the firste figure of the multiplicande, the seconde vnder the seconde, and the third vnder the third, yf there be so manye, and then drawe a ryghte lyne vnder them, as in the other operations goynge before. After you shall multiplie all the fygures of the multiplicande by the multiplyer, and set downe the fygures (commynge of any suche multiplication) vnder the lyne euery one in order.

Example, I woulde multiplye 123. by. 3. that is to saye, I woulde knowe howe muche amounteth thrytymes one hundreth, twentie and three. The twoo nombers beynge placed in suche order as is before sayd,

saied, you muste beginne towardes the right hande: and say thus three tymes three are nine, wryte downe 9. vnder the line right against 3. for the firste figure: secondlye by the same three you muste multiplie the seconde fygure 2. and they make 6: putte downe 6. after the 9. vnder the line: Thirdly by the same 3. you shall multiplie the laste figure. 1. and they are but 3. set downe 3 after 6. for the thirde and laste figure. And thus is that worke ended: whereby you shal finde, that 123. being multiplied by 3. maketh 369.

1 2 3
3
3 6 9

But when that of the multiplication of one figure by an other: The sum whiche commeth thereof shal be of two figures, as it happeneth moste often, then shall you wryte downe the firste figure, and kepe the other figure to bee added vnto the multiplication of the next figure.

Example. Syre menne haue gained (every one of them) 345. crow-

nes, I woulde knowe howe manye
345 Crownes, thei hadde in all.
6 Fyrſte I multiplye 6. times
2070. fiue are. 30. I wright. 0. vn-
der the line, and keepe. 3. to bee added
to the nert multiplication: Secondlye
I ſaie 6. tymes four, are. 24. vnto the
whyche I adde 3. whyche I reſerued.
And thei make 27. I wryt. 7. in the ſe-
cond place vnder the line, and I kepe
2. to be added to the nert multiplicati-
on, thirdlie I ſaie fire tymes. 3. are 18.
vnto the whiche I adde the. 2. whiche
I kepe, and thei make. 20. the whiche
I wright all doune for becauſe that is
the laſte woorke. And ſo I fynde that
345. beyng multiplied by. 6. doe make
2070. When the multiplier is of ma-
nie figures you muſte multiplie al the
whole multiplycande by euerye one
of thoſe figures, & wryte the produces
euerie one vnder his owne figure.

Example. I woulde knowe howe
manye dayes are paſte from the natt-
uitie

nitie of Jesus Christe vntill the yeare 1560. full complete. I haue to multiplie. 1560. by 365. which are the daies of one whole yere. The leape yeares not beyng reckened, which haue euerie one of them. 366. daies.

1560
365
7800

First by the figure. 5. I multiplie all the higher figures, saiyng thus. 5. tymes. 0. maketh. 0. I wryte. 0. vnder the lyne for the firste figure, and because I keepe nothyng for the nexte place. I proceede and saye. 5. tymes 6. are. 30. I sette 0. vnder the lyne for the seconde figure, and I keepe. 3. to bee added to the nexte multiplication, thirdlie I say 5. tymes. 5. are. 25. The whiche with 3. that I keepe are. 28. I sette doune 8. and keepe. 2. to bee added with the nexte multiplication. Then comming vnto the fourth and laste figure, I saie fiue tymes. 1. are. 5. the whiche with 2. that I reserued are 7. I putte 7. for the laste figure of thys firste operation

by the figure. 5. with the which figure we haue no more to doe. And therfore I cancel the same. 5. with a little strik through it, to signifie that wée haue finished with that figure. And for as muche that in multiplication there is alwaies as manie simple operations, as the multiplier conteineth figures. There resteth yet two operations to be made. I come then vnto the seconde operation, whiche is by the fygure 6. by the whiche I muste againe multiply all the figures of the multiplicand as I did by 5 and the first figure, which shalbe produced, you muste putte one ranke more lower then the figures of the operation euen nowe made by fiue: not right vnder the firste fygure of the multiplier fiue, but vnder fiue: that is to say: one place more forward then the fiue towarde the left hande, and one rancke more lower then the firste operation: and you shall put afterwarde euerie of the other figures whiche commeth of the same multi-

plication

plication in their order: thirdlye you muste make the multiplication by the thirde figure and that whiche shall come thereof you muste sette in hys ranche, as here vnder you see. And nowe wee neede make no further discourse hereof, because that hee whiche canne doe the firste multiplication by fine, may as easely doe all the others. It shall therefore suffice to sette here vnder the examples.

1560	1560
365	565
7809	7800
9360	9360
	4680

Nowe, if you will knowe howe muche the operations thus placed doe amount vnto, which in value are but one number: you muste adde those three numbers together, but not after the same maner as wee haue done in the chapiter of addition, the first figure of the first ranck with the firste figure of the second ranck, and of the thirde: but

you muſte adde them in the ſame ſorte as you ſhall finde them ſituated or placed: that is to ſaie, the firſte figure of the fyrſte rancke alone by it ſelfe the ſeconde of that ranck with the firſt of the ſeconde rancke. The thirde of the firſte rancke wyth the ſeconde figure of the thyrde rancke: and ſo of all other as hereafter doth appeare.

```
  1560
   365
------
  7800
 9360
4680
------
569400
```

And thus the 1560 yeares doe containe fyue hundred ſirty and nine thouſand four hundred daies not counting herein the dayes of the leape yeares, whiche are heare in numbre 320. then the whole ſumme of the daies ſhoulde be 569790.

¶ Another Example.

The

```
    34560
     2456
  ------
   207360
  172800
 138240
 69120
 ---------
 84879360
```

The summe of multiplication, when you would multiplie any number by 10. you muste onelye adde one cipher vnto all the number. As 345. multiplied by 10. maketh 3450. yf you will multiplie by. 100. Adde vnthe whole number two cyphers. 00: yf by 1000. adde. 000. And to be briefe, when the laste figure of the multiplier is. 1. and all the rest be ciphers, adde so many ciphers to your multiplicande, as ther shalbe foūd in your multiplier

But yf in multiplyng, the laste fygure were not one, but that there were onelye certayne Cyphers in the beginnynge: and that the other were signifiynge fygures, and

likewise those of that multiplicande, then shall you putte those cyphers a part, and multiplie the signifiyng figures of the one by the signifiyng figures of the other. Than adde vnto the product of that multiplication, all the ciphers whiche you dyd before put a part. As if I would multiply. 46000 by 3500. I put apart the three ciphers of the fyrste, and twoo ciphers of the seconde numbers. And then I multiply fourtie sixe by 35. and thereof commeth 2610: vnto the whiche I add the 00000. and then the whole producte will be. 161000000.

```
   46
   35
  ----
  230
 138
 ----------
 161000000.
```

Of

Of diuition the 5. chapiter.

DIuition or partition is, to ſeeke how many times one numbre dothe containe an other for in thys operation ar firſt required two numbers for the findyng out of the thirde. The firſte numbre is called the diuidende or numbre whiche is to bee deuided, and that muſte bee the greater numbre, the other numbre is called the diuiſor, and that is the leſſer. And the thirde numbre which we ſeeke is called the quotient. As if I woulde deuide 36. by 9. the diuidend ſhalbe 36. and the diuiſour is 9. And for becauſe that nine is conteined in 36. foure times, that is to ſaie, that 4: times 9. do make 36. The quotient ſhalbe 4. as in marking how many tymes 9. is conteined in 36.

The practiſe.

WRite doune firſte the diuidende in the hygher number, and the diuiſor

vnderneth, in suche sorte, that the firste figure of the diuisour towarde the lefte hande be vnder the firste of the diuidend, and euerie figure of the same diuisour vnder hys lyke, that is to say, the fyrste vnder the firste, the seconde vnder the seconde, the third vnder the thyrde, and so consequentlye of the other, yf there bee anie more, whiche is contrarie to the other three kyndes before specified, but you muste consyder if all the lower figures of the diuisor, maye be taken out of the higher figures of the diuidende, by the order of substraction. The whiche if you canne not doe, then muste you sette the fyrste figure of the Dyuysour (towarde the lefte hande) vnder the seconde figure of the diuidende, and so consequentlye the reste, if anie bee to be sette doune euerie one of them vnder his like as before is saied. And than drawe a line betweene the diuidende and the diuisour. And at the ende of them an other croked line, behinde the whiche to-

towarde

warde the right hand, shal be set your quotient. As by this example following wher the diuisor is but of 1. figure

If you woulde diuide 860. by. 4. you muste sette doune. 4. vnder the. 8. with a line betweene them as hereunder you may se.

860. the diuidende
4 diuisor.

And then you muste seeke howe many times the diuisour in contained in the higher numbre, or diuidende aunswering to him, as in this our example I muste seke how many tymes 4. is contained in. 8. in the whiche I finde 2. tymes, then I wryte doune. 2. aparte behinde the crooked lyne, as you se, whiche shall be the firste figure of the quotient to come, secondlye by this figure (beeynge thus putte aparte) I must multiply the diuisor: and vnder the same multiplication.

860
4 (2
8

I muste sette that number whiche com-

commeth of the ſame multiplication, as two tymes foure doe make eight, whiche eight I doe ſet vnder the four, whiche is the diuiſour. Thirdlie I doe ſubſtract the product of the ſaied multiplication (of the quotient by the diuiſor) from the higher numbre correſpondant to the ſame, as if I abate 8. from 8. there remaineth nothyng, and then I cancell or ſtryke out that whiche is doen as you ſee. In theſe three operations is comprehended the art of diuiſion. The which ar to be obſerued from point to point, for there is no diuerſity in the finiſhyng of the ſame whiche is thus.

I muſte remoue myne diuiſor one place nerer towarde my right hande, as in procedyng with.

oure exãple, I remoue my diuiſour 4. whiche was vnder. 8. and I ſet it vnder. 6. then I ſeeke howe manye tymes. 4. is conteined in. 6. where I finde but one tyme, then I ſette. 1. be-

8 6 0 (21.
2
4

hinde

hinde the croked line behinde. 2. after-warde by this laſte and new figure. 1. I multiplie the diuiſour. 4 and that maketh but. 4 (for an vnitie whiche is but. 1. encreaſeth nothyng) I abate 4. from the higher figure. 6. and there reſteth. 2. the whiche 2. I ſette ouer the 6. and I cancell the. 6. for ſo muſt you do when there reſteth any thing after you haue made the ſubſtractiō. Third-lye for that there yet remaineth an o-ther, figure in the diuidend, I remoue againe the diuiſour, and I ſett vnder the cipher. 0. Then I ſæke how many tymes foure is in the higher number whiche is. 10. where I fynde 5. times, I put. 5. behinde the crooked lyne for the third and laſt figure of the quotient. Then by the ſame 5. I mul-tiplie the diuiſour 4. and that maketh 20. the whiche I abate from the high-er number, and there reſteth nothing. And ſo is thys diuiſyon ended: and I haue

2
8 6 0 (215
4
25

haue founde that.860.being diuided by foure, bringeth for the quotient 215.that is to ſaie, that.4.is conteined in 860.two hundred and fiftene tymes. This is the moſte eaſieſt worke kynge that is in diuiſion, but that whiche foloweth, appertayneth to the whole and perfecte vnderſtandyng of the ſame. When the firſte figure of your diuiſor towarde your leſte hande is greater then the firſte of the diuidende, you muſt not place the firſte figure of your diuiſor right vnderneth the firſt of your diuidend, but vnder the 2.figure of the ſame diuidende, nerer to your right hand, as before is ſated.

When the diuiſour is of manye figures, and that you haue to ſeeke howe manye tymes it is contained in the higher numbre (for the more eaſier worckyng) you muſt not ſeeke to abate the diuiſour all at one tyme, but you muſte ſee and marke howe maye tymes the firſte figure of the ſame towarde the leſte hande is contained in

the

the higher numbre aunsweringe to the saied numbre, and then to work after ẏ same maner as is before taught.

Example. I haue. 316215. crownes to be deuided amonge. 45. menne for to make my diuision, I muste not putte the firste figure of the diuisour whiche is. 4. vnder the firste of the deuidende, whiche is. 3. because that. 4. is greater number then. 3. And further, I can not take. 4. out of. 3. wherfore I muste sette the. 4. vnder the seconde figure of the higher number whiche is. 1. and the fygure. 5. of the diuisour next right vnder the. 6. as you maie see.

316215
45

I muste firste seeke, howe many tymes 45. is contayned in 316. whiche is but parte of the diuidende, wherefore for the more easie workyng I nede but to seke how many tymes 4. is conteined in 31. & because I may haue it 7. tymes I put. 7. behinde the croked line, as is afore-

aboue ſaied, then by. 7. I multiply all the diuiſour. 45. and they are 315: the whiche I ſet vnder the ſame diuiſour, the fyrſte figure vnder the fyrſte. And the other in order towarde the lefte hande. Then I ſubſtract thre hundred fiftine, from the higher number. 316. and of this fyrſt worcking there remaineth but. 1. the whiche I ſette ouer the 6 and I cancell the 315, and the other figures 3, 1, 6, alſo the diuiſour: and then it will ſtande thus.

1

3 1 6 2 1 5

4 5 (7

3 1 5

And when I come to remoue the diuiſour, and that I muſte ſæke howe manye tymes it is contained in the higher numbre, if I ſe that I can not finde it there, that is to ſaie that if the higher numbre be leſſer thā the diuiſonr, as it is in this example, then muſt I put a cipher in the quotient behind the croked line, and if ther remaine anye fygures in the diui-

dend

dende whiche are not finished, I must remoue the diuisor againe nerer towarde my right hande by one place, for to finde a newe figure in the quociente. As in this our example, for after that I haue remoued the diuisor, I seke how many tymes. 45. is conteined in. 12. and because I can not haue. 45. in. 12. I put a 0. behinde the croked line after 7. then without multiplyng or abatyng, I remoue again the diuisor nerer toward my right hand, and I seke how many tymes 4 (which is the first figure of the diuisour) is in the higher nomber, that is to saie, in. 12. whereas I find it 3. times I putte. 3. behinde the croked line, for the thirde figure of the quocient: then by. 3. I multiply the diuisor. 45. and thereof commeth 135.

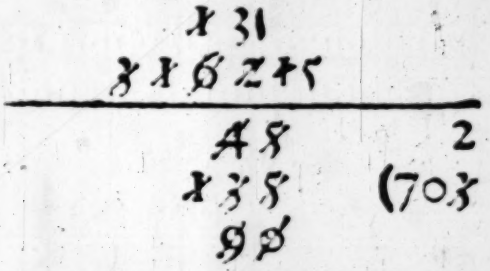
```
    1
3 1 6215
---------
    45 (70
```

```
    1
3 1 6215
---------
    45 (703.
    135
```

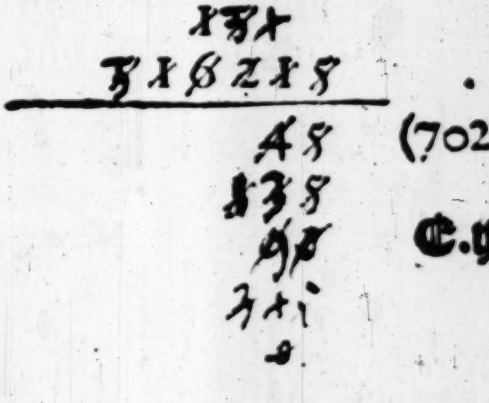
But here is to bee noted, that if it happen that the figure beyng laſte founde, whiche is put in the quotient, doe produce or bryng forthe a greater number (in multiplyng al the diuiſor by the ſame) then that whiche is ouer the ſaied diuiſor: you muſt then make the ſame figure of your quotient (whiche you dooe put downe) leſſer by one. and after that you haue cancelled the firſte multiplication, you muſte make a newe. And the ſame muſt be ſo doen as often tymes: as (in decreasyng the ſame) it produceth a leſſer number, or at the leaſte, a number egall to that, whiche is ouer it. As in the laſte worke for becauſe that the diuiſour, beyng multiplied by. 3. bryngeth forthe 135. whiche amounteth more then 121. the ſame producte muſt be cancelled. And likewiſe the figure. 3. whiche I did put in the quotiēt, muſt be chaunged into a figure of. 2. Then by the ſaied. 2. I muſt multiplie the diuiſor. 45. & therof commeth 90. the whiche I abate from

121

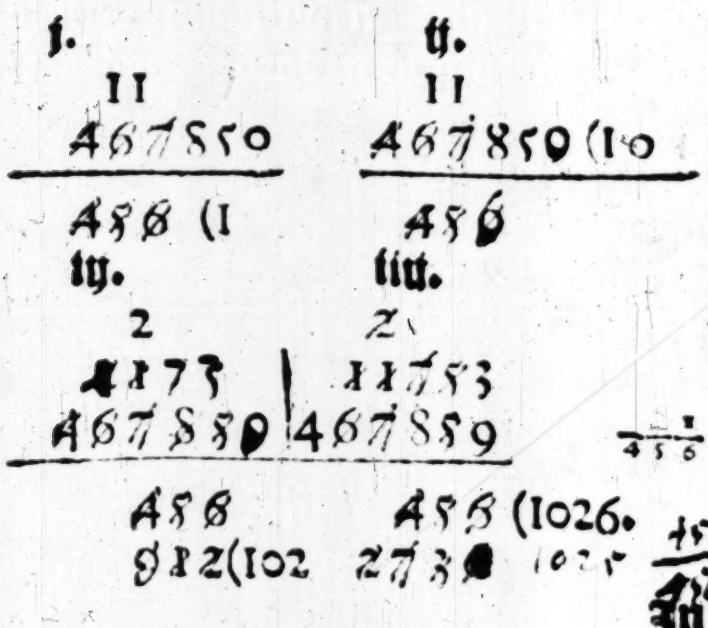
121. and there remaineth. 31. And then will the somme stande thus.



And here is also to be noted, that the somme whiche remaineth, must be alwaies lesser then the diuisor. Then finally, I remoue the diuisor to the. 2. last figures towarde the right hande, and I seeke how many tymes 4. is in 31. And for because I finde it. 7. times I put. 7. in the quotient: by the which I multiplie the diuisoure, and thereof commeth. 315 the whiche I abate frō the higher number of the diuidende, and there remaineth nothyng, as here you maie see. A note.



But in caſe that after the diuiſion is ended, there doe remaine any thyng in the diuidende, as moſte often times there doeth: I muſt then ſette that remaine aparte behinde the croked line, after the entier quotiente, and the diuiſor, right vnder theſame remaine, with a line betweene them bothe, as in this diuiſion followyng, where there remaineth.3. in the laſt worke of the ſame. And we ſhall ſee what theſame doeth ſignifie, when we ſhall treate of fractions, or broken nombers.



In somme, all the whole practise of diuision, maie be kept in remēbrāce by three letters, that is to saie: S. M. A whiche three letters dooe signifie to seeke, to multiplie, to abate.

Firste, I must seeke how many tymes the diuisor is conteined in the higher nomber: then, by the quotiente (whiche I finde) I must multiplie the diuisor: finally, I must abate the producte of that multiplicacion, from the higher nomber to thesame correspondent, that is to saie: out of the dividēde aunswerying to the diuisor.

And further, besides this kinde of woorkyng in diuision. The whiche is reguler and common: I will here put an other maner of woorkyng verie easie. The whiche shall serue for suche diuisiōs as are difficil to be wrought. That is to witte, when the nomber to bee diuided is verie greate, and the diuisor greate also, and it shall serue againe for to auoide errour in supputacion, and for the placyng of fewer

figures in the quotiente: and consequently it shall saue muche labor vnto the, whiche as yet haue not muche studied in this art. The practise whereof is thus, as followeth.

I haue to deuide. 7894658. by 643. In the firste place, you shall vnderstande, that although the firste figure of the diuisor towarde your lefte hande, maie bee founde many tymes in the higher number, as. 10. tymes, 12. tymes or more: yet is it so, that you must neuer putte but one figure onely at a tyme in your quotient.

And thus you shall at no tyme put any number in your quotient, whiche exceadeth the figure of. 9. that is to saie, any number beyng greater then 9. for to come then vnto your practise, write downe your diuisour one tyme: and behinde it towarde youre righte hande, drawe a line doune straighte, and right against thesame diuisor behinde the line put this figure. 1. Then double your saied diuisour, and right against

againſte the ſame (beyng doubled) put behinde the line the figure of. 2. After adde vnto the ſame number (whiche you doubled) your ſaied diuiſour, and right againſte the ſame produce, behinde the line putte the figure of 3. And vnto this thirde produce, you muſte adde againe your diuiſor: and right againſte the ſame produce, behinde the line ſette the figure. 4. And this muſte you doe, vntill you come to the figure of. 9: in ſuche ſorte that euery of the produces doe ſurmounte ſo muche his former noumber, as all the diuiſoure dooeth amounte vnto: placyng at the right ſide of euery produce behinde the line, the noumber whiche ſignifieth howe muche he is in order. That is to ſaie, righte againſte the fifte produce, you muſte putte. 5. right againſte the ſixte produce, you muſt put. 6: and ſo likewiſe of all the other.

Example of the diuiſour propoſed, 643. firſte, I write doune. 643. and

643	1
1286	2
1929	3
2572	4
3215	5
3858	6
4501	7
5144	8
5787	9

right againſt the ſame behinde the line, I put. 1. ſecondly, I double 643. and they make. 1286. and righte againſte hym behinde the line I put. 2. Thirdly, vnto that ſame. 1286. I adde the diuiſor. 643. and thei are 1929. and right againſte the ſame I ſet. 3. Fourthly, vnto the ſaied 1929. I adde the diuiſor. 643. and thei are 2572. and right againſte the ſame I putte. 4. And thus muſt you dooe alwaies by encreaſyng ſo muche euery producte, as the diuiſor doeth amount vnto, vntill you haue ſo doen nine tymes, as you ſee in this preſent table.

This beyng dooen, you muſte ſette downe your diuiſor vnder the diuidende, after the ſame maner as is before declared: that is to ſaie. 643. vnder

der the three firſte figures of the diuidende, towarde your righte hande, which are. 789: Then muſt you ſeke how many times. 643. are conteined in. 789: And for to knowe theſame, I looke in my forſaied table, if I maie there finde the ſame nombers. 789. the whiche is not there: Therefore I muſt take a leſſer nomber, the nereſte to it in quantitie, that I can finde in the table, the whiche is. 643. whiche nomber hath againſte it on the righte hande of the line this diget. 1. Then I take theſaid. 1. and I put it behind the croked line, for the firſte figure of the quotiente.

Then I doe abate. 643. from. 789 and there remaineth. 146. the which I putte ouer the. 789. and I cancell the. 789. and thus is the firſte operacion ended. Then I ſette forewarde the diuiſour, one figure nerer to my right hande, and I ſeeke a newe quotient, as I ſought this, where I finde the higher number ouer my diuiſour

to bée. 1464. The whiche I doe ſeeke in the table, and becauſe I can not finde it there, I take a leſſer number, the nigheſt to it that I can finde, and that is. 1286: whiche number hath againſte it this digette. 2· I putte. 2. for the ſeconde figure of the quotient behinde the line, and I doe abate. 1286. from. 1464. and there remaineth. 178

Thirdly, I remoue forward the diuiſor, as before, and I finde the higher number to be. 1786. and that the nert leſſer number to it in my table, is againe. 1286. I putte therefore ones againe. 2. in the quotient for the thirde figure: and I abate. 1286. from. 1786. and there remaineth. 500.

Fourthly, I ſet forward the diuiſor and the higher nũber ouer it, is. 5005 and the nert leſſer number to it in my table is. 4501. right againſt the whiche nomber is. 7. I putte. 7. in the quotiente, for the fowerth figure. And after that I haue abated. 4501. from 5005. there remaineth. 504.

Finally

Finally, I remoue forward my diuisor vnto the laste place: and I finde the higher number to bee. 5048. And the nexte lesser noumber to it in my table, is. 4501. I sette. 7. againe in the quotient, for the fifte and laste figure. Then I take. 4501. from. 5048. and there remaineth. 547. whiche must be put at the ende of the whole quotiente with the diuisor vnder it, and a line betwene them, in this maner folowing.

(12277 $\frac{547}{4501}$

¶ The somme of deuision.

When you would deuide any number by. 10. you muste take awaie the laste figure nexte towardes your right hand, and the rest shalbe the quotient. As if you would diuide. 46845 by 10. take awaie the. 5. & then. 4684. shalbe the quotiente, and the. 5. shalbe the number that doeth remain. Likewise when you would diuide any number by

by. 1 0 0. take awaie the twoo laſte figures towardes your righte hande, and if you woulde diuide by 1000 take awaie thre figures, if by. 10000. take awaie fower figures. And ſo of all other, when the firſt figure of the diuiſor toward the lefte hande, ſhalbe onely. 1. and the reſte of the ſame diuiſour beyng but cyphers.

¶ Here followeth the proofes of addition, ſubſtraction, multiplication, and diuiſion.

¶ The proofe of addition.

When you would proue, whether your additiõ bee well made, conſider the figures of the numbers, whiche bee added, euery one in his ſimple value: not hauyng any regarde to the place where he ſtãdeth, but to recken hym as though he were alone by hymſelf, and then recken them all, one after an other, caſtyng

sting awaie from them the number of 9. as ofte as you maie.

And after youre discourse made, kepe in minde thesame figure whiche remaineth after the nines be taken awaie, or sette thesame in a voide place at the vpper ende of a line. For if your addition be well made, the like figure will remaine, after that you haue taken awaie all the nines, out of the totalle somme of thesame addition, as often as you may ther finde any: as in this addicion which here you se. There remaineth. 2. for eche part

24567	2
5329	
481	
30377	2

¶ The proofe of substraction.

ADde the number whiche you doe substracte, with that number which remaineth after the substraction is made: and if the totall somme of that addition, bee like vnto the number from the whiche the substracion

ſtraction was made, you haue doen well, otherwiſe not: as in this example dooeth appeare, where you ſee the number whiche is to bee ſubſtracted, is. 3584. and the number whiche dooeth remaine, is 1879. the whiche two ſommes beyng added together, doe make 5463. which is like to the higher number, out of the which the ſubſtraction was made, as before is ſated.

5463
3584
1879
5463

¶ The proofe of multiplication.

THe proofe of multiplication, is made by the help of diuiſion, for if you diuide the number produced of the multiplication, by the multiplier: you ſhal finde the higher number, whiche is the multiplicande.

¶ The proofe of diuiſion.

TO knowe if your diuiſion be wel made: you muſt multiplie all the quotiente by your diuiſor, and if any thyng remained after youre diuiſion was

was made. The same shall you adde vnto the produce, whiche commeth of the multiplication: and you shal finde the like number vnto your dividende if you haue wel divided: otherwise not

¶Of progression, the vi. Chapiter.

PRogression Arithmeticall, is a briefe and spedie assembling, or addyng together of diuers figures or numbers, euery one surmountyng thother continually, by equall difference: as 1. 2. 3. 4. 5. &c. here the diffrence, from the first to the seconde is but of 1. and so do al the other, euery one excede an other by. 1. still to thende. Like waies. Here 2. 4. 6. 8. &c. doe procede by the difference of. 2. also. 3. 6. 9. 12. &c. doe euery one differ from other by. 3. and so may these nũbers continue. Infinitly after this order, in addyng vnto the thirde number, the quantitie wherein the secõde doth differ frõ the first: likewaies addyng

Progression Arithmeticalle.

addyng the ſame difference vnto the fowerth number, alſo to the fifte, and ſo vnto all the other. As. 1 4. the difference of the ſeconde to the firſte is. 3: adde. 3. vnto. 4: and thei are. 7. for the thirde number: Then adde. 3. vnto. 7: and thei make. 10. for the fowerth nũber, and ſo of all other.

Then if you will adde quickly the number of any progreſſion, you ſhall doe thus, firſte tell how many numbers there are, and write their ſomme doune by it ſelf, as in this example, 2.5.8.11.14. where the numbers are 5 as you maie ſee, therefore you muſte
5. ſette doune. 5. in a place alone, as I haue dooen here in the margent.

Then ſhall you adde the firſt number, and the laſte together, whiche in this example are. 1 4. and. 2. and thei make. 1 6. take halfe thereof, whiche is. 8. and multiplie it by the. 5. whiche I noted in the margente, for the nomber of the places, and the ſomme whiche amounteth of that multy-

plication

plication, is the iuste somme of all those figures added together, as in this example: 8. multiplied by. 5. doth make. 40. and that is the somme of al the figures.

An other example of parcelles that are euen, as thus. 1.2.3.4.5.6. In this exãple you must likewaies note down the number of the places, as before is taught, and thẽ adde together the last nomber and the first. And the somme whiche commeth of that additiõ, shall you multiplie by halfe the nomber of the places, whiche before are noted, and that, whiche resulteth of thesame multiplication, is the whole somme of al those figures, as in this former exãple, where the nomber of the places is 6. I note the 6. apart, and then I adde 6. and. 1. together, whiche are the laste and firste nombers, and thei make. 7. the whiche I multiphe by. 3. whiche is halfe the nomber of places, and thei make. 21. and so muche amounteth all those figures added together. 6.

Progreſſion. Geometricall.

Progreſſion Geometricall is, when the ſecond nomber containeth the firſt in any proporcion. 2. 3 or. 4. times and ſo forthe. And in like proporcion ſhall the thirde nomber contain the ſecond, and the foweꝛth, the third, and the firſt the foweꝛth. &c. As. 2. 4. 8. 16. 32. 64. here the proporcion is double.

Likewaies. 3. 9. 27. 81. 243. are in triple proporcion.

And. 2. 8. 32. 128. 512. are in proporcion quadruple.

That is to ſaye, in the firſte example, where the proporcion is double, euery nomber containeth the other. 2. tymes. In the ſeconde example of triple proporcion, the noumbers exceade eche other thre times. And in the third example, the nombers exceade eche other foweꝛ times, and thus you ſe that progreſſion Arithmeticalle, differeth from Progreſſion Geometricalle for that, that in ỹ Arithmeticall. The exceſſe is only in quãtitie, but in the Geometricall, the exceſſe is in proporcion.

Now

Nowe if you will eaſelie finde the ſomme of any ſoche nombers, you ſhal dooe thus, conſider by what noumber thei be multiplied, whether by. 2. 3. 4. 5. oz any other, and by theſame nomber. you muſt multiply the laſt ſomme in the pzogreſſion. And from the pzoducte of the ſame multiplication, you ſhall abate the firſt nomber of the pzogreſſion. And that whiche remaineth of the ſeied multiplicacion, you ſhall diuide by. 1. leſſe then was the nomber, by the which I did multiplie. And the quocient ſhall ſhew you the ſõme of all the nombers in any Pzogreſſion. As in this exaumple. 5. 15. 45. 135. 405. whiche are in triple pzopozcion: now muſte you multiplie. 405. by. 3. and thei are. 1215. from the which you ſhal abate the firſt nomber of the pzogreſſion, whiche is. 5. and there reſteth 1210. the whiche you ſhall diuide by the nõber leſſe by. 1. then by the which you did multiplie, that is to ſaie, by. 2. and you ſhall finde in the quocieẽt 605.

whiche is the totall ſomme of the nõbers of that progreſſion. Likewiſe. 4. 16. 64. 256. 1024. whiche are in proportion quadruple: therfore multiplie 1024. by. 4. and thereof commeth 4096. from the whiche abate the firſt nombet. 4. and there reſteth. 4092. the whiche you muſt deuide by. 3. and you ſhall finde in your quotient. 1364 whiche is the total ſomme of that progreſſion, and this ſhalbe ſufficient for progreſſion.

¶ The. vij. Chapiter treateth of the Rule of. 3. called the golden Rule.

THE rule of three is the chiefeſt, the moſte profitable, and the moſte excellente rule of all the rules of Arithmetike. For al other rules haue nede of it, and it paſſeth all the other, for the whiche cauſe it is ſaied, that the Philoſophers did name it the golden rule. And after others opinion and iudgemente, it is

called

called the rule of proportions of nombers. But now in these daies, by vs it is called the rule of three, because it requireth three nombers in his operation. Of the whiche three nombers, the twoo first are set in a certain proportion. And in suche proportion as thei be stablished, this rule serueth to finde out vnto the third nomber, the fourth nomber to hym proportioned, in suche sort as the seconde is proportioned vnto the firste. Not for that, that the fower nombers, nor yet the three, are or bee proportionall, or set in one proportion, but suche proportion, as is from the firste to the seconde, ought to bee from the thirde vnto the fowerth, that is to saie, if the seconde nomber doo contain the firste, twoo tymes or more, so many tymes shall the fourth nomber containe the thirde. And note well that the firste nomber, and the thirde in euery rule of three, ought and must ber alwaies semblable, and of one condition. And the second nom-

ber, and the fowerth muſte likewiſe bee of one ſemblaunce and nature. And are diſſemblaunte, and contrarie to the other two noumbers: that is to ſaie to the firſte, and the thirde. And if you dooe multiplie the firſte by the fowerth. And the ſeconde noumber by the thirde. The twoo multiplications will bee egall. Likewiſe if you diuide the one ſembleaunte by the other, that is to ſaie, the thirde noumber by the firſte. And likewiſe the one diſſembleaunt by the other: that is to ſaie, the fowerth nomber by the ſecond (which are diſſembleaunt to the other twoo nombers) your twoo quocientes will be egall

Regul. The ſtile of this rule is thus, you muſte ſette doune your three noumbers in a certaine order, as by example here vnder ſhal appeare. And then multiplie the thirde noumber, by the ſeconde. And the produce thereof you muſt diuide by the firſte noumber, or otherwiſe, diuide the firſte noumber by

by the ſeconde. And the quocient ther-of ſhalbee diuiſor alſo vnto the third nõber that is to ſaie, the thirde nomber ſhall bee diuided by the quotient of the forezaied diuiſion, that is of the firſte noumber diuided by the ſeconde. Or otherwiſe diuide the ſecond noumber by the firſte. And that whiche cõmeth into your quotiente, you ſhall multiplie it by the thirde nomber. And thus ſhall you haue the fowerth noumber, whiche you ſeke for.

¶ Example.

IF .8. be worthe .12. what are 14. worth after the rate, or els if .8. require .12. for his proportionall, what will .14. demaunde? The whiche three noumbers maie conuenientlie bee ſette in ſorthe order, as hereafter doeth appere.

If .8. ——— 12. ——— 14. multiplie the thirde nomber .14. by the ſeconde, whiche is .12. And thereof commeth

(for the whole produce of this multiplication. 168. the whiche (as the rule teacheth) you muste diuide by the firste nomber, that is to saie by. 8. and thereof commeth. 21. And so muche are the. 14. worthe. This is the waie, whiche is moste vsed.

Otherwise diuide. 8. by. 12. whiche you can not doe, for thei are $\frac{8}{12}$. wherefore abrewie. $\frac{8}{12}$. and thei are $\frac{2}{3}$. for your quotient, then diuide the thirde nomber. 14. by the saied $\frac{2}{3}$, and you shall haue. 21. as before. Or els diuide the seconde nomber. 12. by the firste nomber. 8. thereof commeth. $1\frac{1}{2}$. the whiche $1\frac{1}{2}$ you shall multiplie by 14. and thereof will come. 21. as is aboue saied, and thus muste you doe of all other. And although, that the nõbers of this rule maie bee founde in three differences, for sometymes thei are whole nombers and broken together, sometymes broken and broken together, and somtymes all whole nombers, if thei bee whole nombers, you muste doe none other.

otherwise, then you did in the last exā-ple. But in case thei be broken noumbers, or broken and whole noumbers together, the maner and waie to dooe theim, receiueth a certaine variacion, and difficultee, according to the varietie of the noumbers, the whiche operation easely to do, and vnuariable, this rule teacheth.

The three noumbers beyng sette doune, according vnto the order of the whole noumbers aforesaied, without any broken nomber, let. I. bee put alwaies vnderneath euery whole nomber, with a line betwene them fracciō wise, as thus $\frac{8}{1}$. and that. I. is denominatour to euery soche whole nomber. When you haue whole nomber and broken, thei must bee reduced and added with their broken nomber, and if there bee broken nomber without any whole nomber, thesame broken must remain in their estate.

A Rule.

This beynge doen, you shall mul-

tiplie the denominatour of the firste nomber, by the numeratour of the second, and the producte thereof againe by the numerator of the third nōber. And so shall you haue the diuidende, or nomber whiche muste bee diuided, then multiplie the numeratour of the first nōber, by the denominator of the seconde, and the product thereof by the denominator of the third nomber, and that which cōmeth of this multiplicacion shalbe your diuisor. Then diuide the nomber, whiche is to bee diuided, by the diuisour, and you shall finde the fowerth nomber that you seke. Of the which maner and fashions of the rule of. 3. are diuers kindes, wherof the first is of. 3. whole nombers, as was the last example, and here foloweth the second

If. 15. poundes doe buy me two clothes, how many clothes wil. 300. poūdes buye me of thesame prce, that the twoo clothes did cost, sette doune your three nombers thus.

Lib. Clothes. Lib.

15. 2. 300. 2
2 600
600 1155 (40
1

And thā as you see, multiplie ẏ thirde nomber, which is. 300. li. by. 2. whiche is the second nōber, and therof cōmeth 600. the which. 600. you must diuide by the first nōber. 15. and you shal find in your quociēt 40. whiche is. 40. clothes, and so many clothes shall I buye for. 300. l. as appereth by practise here aboue written. And here you muste marke that the first nōber & the thirde in this questiō be of one denominaciō, and likewise the second & the fowerth which you haue found are of one semblaunce: but in case that the first nomber and the third in any question: bee not of like denominacion, you muste in werkyng bryng them into one, as in this exāple folowing. If. 12. nobles do gaine me 6. nobles, how many nobles wil. 48. poundes gaine me: Here you se that ẏ denominaciō of the first

nomber

nomber is nobles, and the denomina-
cion of the thirde, is poundes, where-
fore, before you doe procede to worke
by the rule of three, you muste firste
turne the poūdes into nobles in mul-
tipliyng. 48. poundes by three nobles
and they make. 144. nobles, for that
there is in euery pounde of money. 3.
nobles, or otherwise if you will, you
maie bryng the first nomber beyng. 12
nobles, into poundes, by diuiding thē
by. 3. and thus shal your first and third
nombers, bee brought into one deno-
minacion. Then shal you sette doune
your. 3. nombers in order thus.

If. 12. nobles doe gaine me. 6. no-
bles, what shall. 144. nobles gaine?
the which. 144. are the nobles which
are in. 48. ii. Then multiplie the third
nomber. 144. by the seconde nomber
6. and thereof cometh 864. the whiche
you muste diuide by. 12. nobles, and
thereof commeth. 72. nobles.

But here it maie perchaunce make
some menne muse, to see all the three
nom-

nombers in this rule of three, to bee of one denomination, whiche can not otherwise bee done, if you reduce the third nomber, to the denomination of the firste. But if you will reduce the firste nomber, to the denomination of the thirde, that is to sale the .12. nobles into pounde, then shall the firste and the third nombers onely agree in one denomination, and the fowerth nomber which you seke, shalbe of the same denomination as is the seconde, as in the former example. If .12. nobles doe yelde me .6. nobles, what will .48. pounde yeld me: first you shall diuide 12. nobles by three to bryng them in pounde, and that shall bee like to the thirde nomber, whiche is .48. pounde, then will the stande thus.

Poundes.	Nobles.	Poundes.	
4.	6.	48.	
		6.	Nobles.
		288.	72
			44

There

There is yet a more exacte waie to worke in this rule of three, whiche is thus. You muste marke if the third & firste nombers in the rule of three, maie bee bothe diuided by one like diuisor: the which after you haue diuided thē, you shall write doune eche of the quocientes orderly, in the saied rule of .3. euery one of theim in his owne place, as though those were twoo of the nōbers of your question, and not chaungyng the middle noumber, that is to saie the seconde, as thus, if .50. Crounes doe buye me .44. yardes of clothe, howe manye yardes shall I haue for 120, here you maye see that the thirde and the firste nombers, maie be diuided by .10. whiche in the thirde nomber is .12. tymes, and in the firste .5. times. Wherefore you shall put .12. for the thirde nomber in the rule of three in stede of 120. and 5. for the firste nomber in stede of 50. and let .44. remain still in the middest for the second nomber, after this sorte as followeth, and

then

then worke by the rule as before.

Crounes	Yardes.	Crounes.
5.	44.	12.
	12.	
	88.	3
	44	528 (105
	528	528

Multiplie. 44. by. 12. and thereof commeth. 528. diuide thesame. 528. by 5. and you shall finde in your quocient 105. ⅗. and euē so many yardes should you haue founde, if you had wrought the rule of three, by the first nōbers proposed. There is yet certaine other varieties, in woorkinge by the rule of three, but for that they require the knowledge of fractions, and because thei are not so easie as this first waie, whiche is common, therefore content your selues with this same, vntil you haue tasted the fractions, the whiche by gods helpe I intende to set forth in seconde part of this boke, incontinently after that I haue firste taught you the

the backer rule of three.

The backer rule of three is so called: because it requireth a contrary woorkyng to that, whiche doeth the rule of three directe, whereof wee haue nowe treated. For in the directe rule of three the greater the thirde noumber is, so moche the greater will the fourth be. But here in this backer rule it is contrariwise, for the greater the third nõber is, so moche lesser wil the fowerth bee. Then, where as in the rule of .3. directe, the third noumber is multiplied by the seconde, and the product thereof diuided by the firste. Here you muste multiplie the seconde noumber by the firste, and diuide the product of thesame by the third, and the nomber whiche commeth in the quotiente, answereth to the questiõ. For suche practise commeth often tymes in vse: In suche sorte, that if you woorke thesame by the rule of three directe (not hauyng a regarde vnto the Proposition of the question) you shoulde then commit

committe an euidente and open errour.

¶Example.

If.15.shillynges worthe of Wine wil serue for the ordinary of.46 men when the Tonne of Wine is worthe 12. poundes: for howe many menne will thesame. 15. shillynges suffice, when the Tonne of Wine is worthe but.8.poundes? It is certain, that the lower the price is, that the Tonne of Wine doeth coste, and so many more persones will the saied.15. shillynges in Wine suffice. Therefore set doune your nombers thus, if. 12. poundes suffice.46.menne, how many will.8. poundes suffice, you muste multiplie 46.by.12.and thereof commeth.552. the whiche.552.you shall diuide by.8. and thereof commeth. 69. and vnto 69. menne will the saied.15. shillynges worthe in Wine suffice, when the Tonne of Wine is worthe but eight poundes, as hereafter dooeth appeare by practise.

Lib.	Men.	Lib.
12.	46.	8.
	12.	
	92.	
	46.	
	552.	

552 (69.
48

Likewise, a messenger maketh a iourney in. 24. daies, when the daie is but, 12. houres long: how many daies shal he be vpon the same iourney, whē the daie is. 16 houres in length? Here you must perceiue, that the moze houres are in a daie, the fewer daies will the messenger bee in goyng his iourney. Therefoze wzite downe your nōbers thus, as here you maie se.

Houres.	Daies.	Houres.
12.	24.	16.
	12.	
	48.	
	24	
	288.	

4
12
288
168
12 (18

And then multiplie 24. daies by. 12 houres,

houres, and thereof commeth. 288. diuide the same. 288. by the thirde nomber. 16. and you shall finde 18. the whiche is. 18. daies, and in so many daies will the messenger make his tourney when the daie is. 16. houres long.

Likewise, when the Bushell of wheate doeth coste. 3. shillynges, the penie loafe of bread wateth. 4. lib.

I demaunde what the same penie loafe shall weye, when the bushell of wheate is worthe but twoo shillynges: here is to bee considered, that the better cheape the Wheate is, the beanier shall the pennis loafe wite, and therefore write doune your. 3. nombers, thus.

Shil.	Lib.	Shil.	
3.	4.	2.	
	3.		xz
	12.		z (6.

Then multiplie. 4. lib. whiche is the secõde nomber, by the first nomber 3. and thei make. 12. the which. 12 you

shall vnide by the thirde nōber. 2. and thereof commeth. 6. lib. and so muche muste the penie loafe of breade waye, when the bushell of wheate is worthe but twoo shillynges, as maie appere.

And nowe, accordyng to my former promise, shall followe the seconde parte of Arithmeticke, whiche teacheth the worckyng by Fractions.

Here endeth the first parte of Arithmeticke.

The

¶ The seconde parte of Arithmeticke, whiche treateth of Fractions or broken nombers.

¶ The firste Chapiter treateth of Fractions, or broken nombers, and the difference thereof.

BRoken nomber is as muche as a parte or many partes of one, whereof there are two noumbers with a line betwene them bothe: That is to saie, the one whiche is aboue the line, is called the numerator. And the other vnderneath the line, is called the denominator: as by example, three quarters, whiche must bee set doune thus, ¾: whereof. 3. whiche is the higher nõber aboue the line, is called the numerator, and. 4. whiche is vnder the line is called the denominator. And it is alwaies conuenient, that the numera-

toz be lesse in nomber, then the denominatoz. Foz if the numeratoz, and the denominatoz were egall in valve: then should thei repzesente a whole nomber, thus, as $\frac{1}{1}, \frac{2}{2}, \frac{3}{3}$, whiche are whole nombers: by reason that the numeratozs of these, and al suche like maie bee diuided by their denominatozs, and their quotiētes will alwaies be but. 1. But in case that ỹ numeratoz do excede his denominatoz, then it is moze then 1 whole: as $\frac{20}{18}$, is moze thā a whole nomber by $\frac{2}{18}$, other diffinition dooeth not hereunto appertaine. Furthermoze it is to bee vnderstande, that the middest of all bzoken nombers, is the iuste halfe of. 1. whole, as $\frac{5}{12}, \frac{7}{14}, \frac{8}{16}, \frac{9}{18}$ and other like, are the halfes of one whole nomber, wherof dooeth growe, and come foz the 2. pzogressions natural: the one pzogrediyng by augmentyng, oz encreasyng, as these.

$$\frac{1}{2}\ \frac{2}{3}\ \frac{3}{4}\ \frac{4}{5}\ \frac{5}{6}\ \frac{6}{7}\ \frac{7}{8}\ \frac{8}{9}\ \frac{9.}{10}\ \text{&c.}$$

And

And thei doe proceade infinitely, and will neuer reche to make a whole nomber, thus $\frac{1}{1}$. And the other progression, dooeth progrede by diminishyng or decreasyng, as thus.

$$\frac{1}{2}\ \frac{1}{3}\ \frac{1}{4}\ \frac{1}{5}\ \frac{1}{6}\ \frac{1}{7}\ \frac{1}{8}\ \frac{1}{9}\ \frac{1}{10}\ \text{&c.}$$

And these dooe proceade infinitely, and shall neuer come to make a . o. whiche signifieth nothyng, but shall euer retaine some certaine nomber whatsoeuer, whereby it dooeth appere that broken nombers are infinite.

¶ The seconde Chapiter treateth of the reducyng or bringyng together of twoo nombers, or many broken dissemblyng, vnto one broken semblyng.

REduction, is as muche as to bryng together, or to put in sembleaunce, twoo or many noumbers dissemblyng one from the other, in reduceyng

them vnto a common denominator. For because the diuersitie and difference of the broken numbers, doe come of the denominators part, or of diuers denominators, and for the vnderstanding hereof, there is a general rule whose operation is thus. Multiplie the Denominators the one by the other, and so you shall haue a new denominator cõmon to al, the whiche denominator diuide by the perticuler denominators, and multiplye euerie quotiẽt by his numerator and so you shall haue newe numerators, for the numbers whiche you woulde reduce, as appeareth by thys example following.

¶ Reduction in common denomination.

1. IF you will reduce $\frac{2}{3}$ and $\frac{4}{5}$ together, you muſt firſte multiplie the .2. denominators the one by the other, that is to saie 3. by 5. maketh 15. which is your common denominator,

minator, that sette vnder the crosse, then deuide. 15. by the denominator 3 and you shal haue 5. whiche multiply by the numerator. 2. & you shall finde 10. sette that ouer the $\frac{4}{5}$. and thei are $\frac{10}{11}$ for the $\frac{2}{3}$. Afterwardes diuide. 15. by the denominator. 5. and thereof commeth 3. the whiche multiplie by the numerator. 4. and you shall finde 12. whiche sette ouer the heade of the $\frac{4}{5}$. and thei make $\frac{12}{11}$. for the $\frac{4}{7}$: as appeareth more plainer in the margent.

If you will reduce $\frac{1}{6}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{5}{6}$, together, you must multiplie all the denominators, the one by the other, that is to saie, 2. by 3. maketh. 6. then. 6. by 4. and mounteth. 24. Laste of all. 24. by. 6. and thereof commeth. 144. for the common denominator. Then, for the firste diuide. 144. by the denominator. 2. and thereof commeth. 72. the whiche multiplie by the numerator 1.

and

and it is ſtil 72. ſet that ouer the $\frac{1}{2}$ and it is $\frac{27}{144}$, for the $\frac{1}{2}$: Then deuide 144 by the ſecond denominator 3. and thereof commeth 48: the whiche multiplie by the ſeconde numerator 2. and they are 96. whiche ſet ouer the $\frac{2}{3}$ and they make $\frac{96}{144}$, for the $\frac{2}{3}$: Then diuide 144. by the thirde denominator 4. & thereof commeth 36. the whiche multiplie by the thirde numerator 3. and thei make 108. whiche ſette ouer the $\frac{3}{4}$. and thei are $\frac{108}{144}$ for the $\frac{3}{4}$.

Finally diuide. 144. by the laſt denominator. 6. and thereof commeth 24: the whiche multiplie by the laſte numerator 5. and thereof commet 120 Whiche ſette ouer the. $\frac{5}{6}$. and thei are $\frac{120}{144}$, for the $\frac{5}{6}$, as appeareth here by practiſe.

¶ The example.

72

72|96|108|120. 2
1 2 3 5 3
2 3 4 6 6
144. 4
24
6
144

144 (72.
22 | 1
72
2
144(36|26
44 3
108

2
144(48|48.
33 | | 2
96.
2
144(24|24.
66 5
120.

¶ Reduction of broken nombers of broken.

IF you will reduce the broken of broken together, as thus, the $\frac{2}{3}$ of $\frac{1}{4}$ of $\frac{4}{5}$, you must multiplie the numerators the one by the other, to make one broken nōber, of three broken nombers, that is to sate. 2. by. 1. maketh. 2. and then. 2. by 4. maketh 8. which is your numerator. Then multiplie the Denominators, the one by the other, that is to sate. 3. by 4. maketh. 12. and then

3.

8
2 1 4
3 4 5
60.

12.

12. by. 5. maketh. 60. for your denominator, sette. 8. ouer. 60. with a line betwene them, and thei be. $\frac{8}{60}$. whiche beyng abrenied, are. $\frac{2}{15}$. and so muche are the $\frac{2}{3}$. of. $\frac{5}{4}$. of. $\frac{4}{5}$. as appeareth in the margent.

¶ An other example of the same reduction, and of the seconde reduction.

4. If you will reduce. $\frac{2}{3}$. of. $\frac{5}{4}$. of $\frac{4}{5}$. the $\frac{5}{4}$. of $\frac{5}{7}$: and the $\frac{1}{2}$. of the $\frac{1}{3}$. of the. $\frac{2}{3}$. of the. $\frac{1}{5}$. Firste, it behoueth you of euery partie of the broken nõbers, to make of eche of them one broken, as by the third reduction is taughte: That is to saie, in multiplyng the numerators by numerators, and denominators by denominators: firste, for the firste parte, whiche is $\frac{2}{3}$. of $\frac{1}{4}$. of $\frac{4}{5}$, you muste as is saide before, multiplie. 2 by. 1. and then by. 4. and you shall haue. 8. for the numerator, likewise multiplie. 3. by. 4. and the produce by. 5. and you shall haue

haue.60.for the denominator, so thet make. $\frac{8}{60}$. whiche beyng abrented, are $\frac{2}{15}$ for the first parte, that is to saie, for the $\frac{2}{3}$ of $\frac{1}{4}$ of $\frac{4}{5}$, secondly for the $\frac{3}{4}$ of $\frac{5}{7}$ multiplie likewise the numerator.3. by.5 maketh. 15. for the numerator, and multiplie. 4. by.7. maketh. 28. for the denominator, and then thet bee. $\frac{15}{28}$. for the seconde parte, that is to saie, for the $\frac{3}{4}$ of $\frac{5}{7}$. Thirdly, for the $\frac{1}{2}$ of $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{1}{3}$. multiplie the numerators thone by the other, that is to saie. 1. by. 1. and then by.2. and lasse by. 1. and all maketh but 2 for the numerator, likewise multiplie.2. by. 2. maketh. 4. and 4. by 3. maketh. 12. and then. 12. by.3. maketh. 36. for the denominator, and thet are $\frac{2}{36}$, whiche beyng abrenied maketh $\frac{1}{18}$. for the thirde parte, that is to saie, for $\frac{1}{2}$ of the $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{1}{3}$. Last of al, take the $\frac{2}{15}$ the $\frac{15}{28}$. and the $\frac{1}{18}$. and reduce them according to the order of the second reduction, and you shall finde $\frac{1000}{7560}$. for the $\frac{2}{36}$. And $\frac{4950}{7560}$ for the $\frac{15}{28}$. And $\frac{420}{7560}$ for $\frac{1}{18}$: and thus are broken nombers of broken,

redu-

reduced, as appeareth by by practise.

8	15	2				
2 1 4	3 5	1 1 2 1				
3 4 5	4 7	2 2 3 3	1008	4050	420	
60	28	36	2	15	1	
			15	28	18	
				7 60		

¶Reduction of broken nombers, and the partes of broken together.

5. IF you will reduce $\frac{1}{3}$. and the $\frac{1}{2}$ of $\frac{1}{3}$. together, to bryng them into one broken nomber, you muste firste sette doune the $\frac{1}{3}$. and $\frac{1}{2}$. as appeareth in the margent with a crosse betwene theim, and then multiply the twoo denominators. the one by the other, that is to saie, 2. by 3. maketh. 6 set that vnder the crosse, then multiplie the firste numerator, one by the laste denominator twoo, and that maketh. 2. vnto the whiche adde

adde the laste numerator one, and thet be three, whiche set above your crosse, so you shall finde that the $\frac{1}{3}$ and the $\frac{1}{2}$ of $\frac{1}{3}$. doe make $\frac{3}{6}$. whiche beyng abrevied doeth make $\frac{1}{2}$, which is as much as the. $\frac{1}{3}$. and the. $\frac{1}{2}$. of. $\frac{1}{3}$. Likewise if you will reduce the $\frac{2}{3}$, and the $\frac{1}{4}$. of $\frac{1}{3}$. you must doe as before, set doune the $\frac{2}{3}$ and $\frac{1}{4}$ with a crosse betwene thē, & then multiplie the twoo denominators, the one by the other, that is to saie. 3. by. 4 maketh. 12. whiche set vnder the crosse as you see in the margent, and then multiplie the firste nomerator 2 by the laste denominator. 4. and thereof commeth. 8. whereunto adde the laste numerator. 1. and that maketh: 9. whiche sette ouer the crosse, so shall you finde that the $\frac{2}{3}$. and the $\frac{1}{4}$ of $\frac{1}{3}$ are worthe $\frac{9}{12}$, whiche abrevied, doe make $\frac{1}{4}$, as appeareth by example in the margent.

Reduction

¶Reduction of whole nombers and broken together into a Fraction.

6. IF you will reduce whole nō-ber with broken, you muste bryng the whole nomber in-to brokē, as by this example maie appere: reduce 17.$\frac{5}{8}$ into a brokē nomber, firste you muste multiple the whole nomber. 17. by the denomina-tor of the broken, whiche is. 8. in sai-yng. 8. tymes. 17. doe maske. 136. vnto the whiche you muste adde the nume-rator of. $\frac{5}{8}$. whiche is. 5. and al amount-eth to. 141. whiche sette ouer. 8. with a line betwene theim, and thei will bee $\frac{141}{8}$ so muche is. 17. $\frac{5}{8}$. worthe in a frac-tion, as it appeareth here by practise.

17.		141.		
8.		5.		
136.	17.	8	maketh	$\frac{141.}{8.}$
5.				
141.				

In

In case you haue whole number and broken to bee reduced, with broken you muste bringe the whole number into his broken, in multiplyinge it by the denominator of the broken number going therwith, and adde thereunto the numerator of the saide broken number, as in the laste example, and then reduce that broken number wyth the other broken, as here appereth by this example. Reduce $10.\frac{2}{3}\&\frac{4}{7}$ togither, first bring $10\frac{2}{3}$ al into thirds, as by the syxt reduction, and you shal finde $\frac{32}{3}$, then reduce the $\frac{32}{3}$ and $\frac{4}{7}$ together, by the syxte reduction, and you shall finde $\frac{224}{21}$ for the $\frac{32}{3}$: and $\frac{12}{21}$ for $\frac{4}{7}$, as appereth here by practise.

$$\frac{32}{10\frac{2}{3}} \quad \frac{224}{32} \times \frac{12.}{4.} \quad \frac{}{3} \quad \frac{}{7.}$$

21

21	32	21	4
3.(7	7	7(3	3
	224		12.

Also in case you haue in bothe partes of your Reduction, as well whole nũber as broken, you must alwayes put the whole into their broken (as by the fyrste reduction) of either part.

¶ Example.

If you wyll reduce 12. $\frac{1}{4}$ wyth 14. $\frac{2}{3}$ to bringe them into one denomination, first bringe the 12. $\frac{1}{4}$ all into fourthes, and you shall fynde $\frac{49}{4}$: then likewise reduce 14. $\frac{2}{3}$ all into thirdes, and you shall haue $\frac{44}{3}$, for the 14. $\frac{2}{3}$, then reduce $\frac{49}{4}$ and $\frac{44}{3}$ together, by the order of the firste Reduction, and you shall fynde $\frac{147}{12}$ for the $\frac{49}{4}$. And $\frac{176}{12}$ for the 14. $\frac{2}{3}$ as here by practise bothe plainlye appere.

$$\frac{49.}{12.\frac{1}{4}} \qquad \frac{44.}{14.\frac{2}{3}}$$

$$\frac{147.}{\frac{49}{4}} \qquad \frac{176.}{\frac{44}{3}}$$

12

The

¶ The thirde Chapter treateth of abbreuiation of one greate broken number into a lesser broken.

ABbreuiation is asmuch as to set downe, or to write a broke nũber by figures of lesse signification, & not diminishing ẏ value thereof. The whiche to doe, there is a rule whose operation is thus, diuide the numerator and likewise the denominator, by one whole number, the greatest ẏ you maye fynde in the same broken number, and of the quotient of that numerator, make it the numerator, and likewise of that of the denominator, make it your denominator, as by example.

1. If you wyl abbreuiat $\frac{54}{81}$, you shal vnderstande that the greatest whole number that you maye take, by the which you maye diuide the numerator & denominator is 27, which is the half of ẏ numerator, & that is a whole number, for you can not take a whole

number oute of the denominator. 81. but that there will bee either more or lesse than a whole number, therefore if you diuide 54. by 27. you shall finde 2. for the numerator, likewise if you diuide 81. by 27. you shall finde 3. for the denominator. then put. 2. ouer the 3. with a line betweene thē, and you shall find $\frac{2}{3}$ and thus by this rule the $\frac{54}{81}$ are abreuiated vnto $\frac{2}{3}$, as appeareth in the margent, and so is to be vnderstande all other.

54.
81.

x
54
27 (2

2
3

2
81 x
27 (3

¶ The forme & maner how to finde oute the greater number, by the which you mai wholy diuide, ỹ numerator & denominator (to thende ỹ you may abreuiat them) is thus.

First

Firſt, diuide the denominator by hys numerator, and if anye number doe remaine, let your diuiſor be diuided by the ſame number, and ſo you muſt continue vntill you haue ſo diuided ỹ there maye nothing remaine, then is it to be vnderſtande, that your laſt diuiſor (wherat you did ende, and that o did remaine after your laſt diuiſion) is the greateſt number, by the whiche you muſt abbreuiat, as you did in the laſte example, but in caſe that your laſt diuiſor be 1. it is a token that the ſame nũber can not bee abbreuiated. Example, of $\frac{54}{81}$ diuide 81. (whiche is the denomination) by 54. which is hys numerator, and there reſteth 27. then diuide 54. by 27. and there remaineth nothinge, wherefore your laſt diuiſor 27. is the number, by the whiche you muſt abbreuiat $\frac{54}{81}$ as in the laſte example is ſpecifyed.

¶ An other ſtile of abbreuiation.

2. Mediate the numerator, and also the denominator of your fraction in case the noumbers be euen, that is to saye, take alwayes the halfe of the numerator, and likewise of the denominator, and of the mediatiõ or halfe of the numerator, make the numerator, also of $\frac{1}{2}$ the denominator, make your denominator, and so continue as often as you may in takinge alwayes the $\frac{1}{2}$ of the numerator, and semblable of the denominator, or els see if you may abbreuiate the numbers which doe remaine, by 3. by 4. by 5. 6. 7. 8. 9. or by 10. for you must abbreuiate them as often as you can by any of the saide numbers, and it is to bee noted, that with whatsoeuer number of these, you doe abbreuiate the Numerator of your Fraction, by the same you muste abbreuiate likewyse the Denominator, so continuynge vntil they can no more bee abbreuied. And it is to bee vnderstande that if the Numerator and the Denominator

be

be euen numbers, as you maye knowe when the fyrſte fygure is an euen nũber, or a 0, thẽ maye you perceaue if both the Numerator and the Denominator may be abbreuied by 10. by 8 by 4. or by 2. although ſ ſome times they maye bee abbreuied by three. And if they be odde numbers, then muſte you conſider if they maye bee abbreuied by 9. by 7 by. 5. or by 3: but when the firſt number, as well of the Numerator, as of the Denominator are euen numbers, then may you well knowe that ſuche numbers maye bee abbreuied be 2. as is afore ſaide. And if you adde the fygures of the Numerator togither, in ſuche manner as you doe in makynge the proofe by nyne in whole Numbers: that is, if you fynde 9. it appeareth that you maye abbreuiate that number by 9. And lykewiſe by 3. and ſometimes by 6. if you fynde 6. it maye bee abbreuiated by 6. and

alwaies by 3. if you finde 3. it is a signe that you may abbreuiate by 3. And by whatsoeuer nomber that you doe abbreuiate the numerator, by the same must you abbreuiate likewise the denominator, and if the first figures of the same nomber be. 5. or 0. you maye abbreuiate them by 5. but if the firste fygures be both 0. they may be abbreuied by 10. in cutting awaye the twoo Cyphers thus, as $\frac{2}{3}|\frac{0}{5}$ whiche maketh $\frac{2}{3}$, & sometimes by 100. thus, as $\frac{1}{2}|\frac{00}{00}$ in cutting away the foure ciphers after this sorte, $\frac{1}{2}|\frac{00}{00}$ and then the $\frac{100}{200}$ doe make $\frac{1}{2}$, and after this maner haue I set here diuers examples, although that all numbers cannot be abbreuied by this rule, that is to saye, all those whiche maye bee well abbreuyed by the fyrste rule aforesayde.

Abbreui-

Abbzeuiated.

by 10	$\frac{3840}{7680}$	by 9.	$\frac{1890}{4928}$
by 8.	$\frac{384}{768}$	by 7.	$\frac{210}{525}$
by 6.	$\frac{48}{96}$	by 5.	$\frac{30}{75}$
by 4.	$\frac{8}{16}$	by 3.	$\frac{6}{15}$
by 2.	$\frac{2}{4}$		$\frac{2}{5}$
	$\frac{1}{2}$		

3. Furthermoze you ſhall vnderſtande that ſometimes it happeneth, that all the fygures of the numeratoz are egall vnto them of the denominatoz, which when it ſo happeneth, you maye thē take one of them of the numeratoz, and alſo one of them of the denominatoz, and it ſhall bee abzeuyed as $\frac{555}{888}$, beinge abzeuiated after this maner commeth to $\frac{5}{8}$. And yet it happeneth ſometimes, that two, oz manye fygures of the numeratoz are pzopoztioned vnto two, oz many fygures

gures of their denominators and the other fygures of the ſame number doe beholde the one the other in thys propoſition: Then may you take twoo or many fygures, as well of the numerator as of the denominator, and by this maner the ſame number ſhall bee abbreuied, as $\frac{4747}{5959}$ whiche beinge abbreuied by this rule, do come to $\frac{47}{59}$.

4. Alſo it happeneth ſomtimes that you woulde abbreuiate one number vnto the ſemblaunce or liken eſſe of another. And for to knowe if the ſame maye be abbreuied, and alſo by what number it maye bee abbreuied, you muſt diuide the numerator of the one number, by the numerator of the other, and likewiſe the denominator of the one, by the denominator of the other, for in caſe that after euery diuiſion there doe remaine 0. and that the twoo quotients be equall, then is one of them the number by the whiche the ſaide fraction muſt be abbreuied, as by exãple of $\frac{115}{207}$. If I woulde knowe if

they

they maye be abbreuied vnto $\frac{5}{9}$, and for to doe this, you must diuide 115. by 5. and you must diuide 207. by 9. and there will come into bothe the quotients 23. by the which it appeareth that this number may be abbreuied by 23.

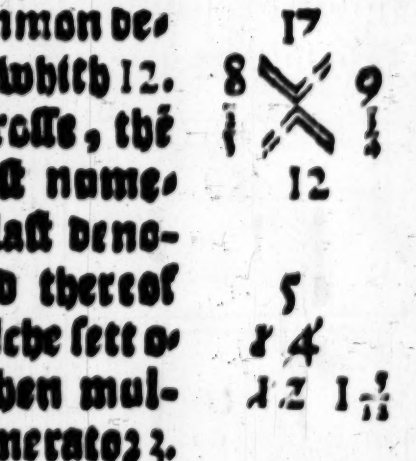
$\frac{5}{9}$. $\frac{115}{207}$ 115 2
55 (23 207
99 (23.

¶ The 4. Chapter treateth of the assembling of two or many broken numbers togither, as by example.

For to adde broken numbers togither, there is a generall rule, which is thus, if the nūbers be vnlike ẏ one to the other, you must reduce thē into a cōmō denomination, whiche after you haue reduced thē, you must then adde both ẏ numerators togither, & set ẏ product of the saide addition ouer the crosse, & diuide the same by the common denominator, as by this exāple folowinge.

1. If

1. If you wyll adde $\frac{2}{3}$ wyth $\frac{1}{4}$, you
muste fyrſt reduce the twoo fractions
bothe into one denomination, accor-
dinge to the introduction of the fyrſte
reduction, that is to ſaye, in multi-
plyinge the denominator of the firſte
fraction whiche is 3, by the denomi-
nator of the other fraction whiche is
foure, and they make
12. for your common de-
nominator, the which 12.
ſet vnder the croſſe, the
multiplie ye fyrſt nume-
rator 2. by the laſt deno-
minator 4. and thereof
commeth 8. whiche ſett o-
uer the $\frac{2}{3}$, and then mul-
tiply ye laſt numerator 3.



by the fyrſte denominator 3. and ther-
of commeth 9. whiche you muſt ſet o-
uer the $\frac{1}{4}$, then adde the numerator
8. with the numerator 9. & they make
17. which ſet ouer the croſſe, and then
your fraction wyll be $\frac{17}{12}$ whiche is the
addition of the $\frac{2}{3}$ wyth $\frac{1}{4}$. And be-
cauſe

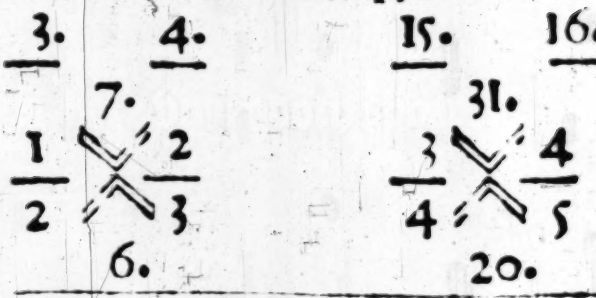
cause your numerator 17. is greater thā his denominator 12. therfore you must diuide 17. by 12. and thereof will come 1. and 5. remaining, which 5. are worth $\frac{5}{12}$, and so muche are the $\frac{2}{3}$ added with $\frac{1}{4}$ as doth appere.

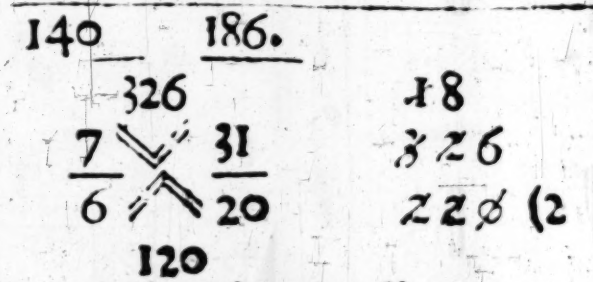
¶ Addition in broken numbers.

2. Also if you will adde $\frac{1}{3}, \frac{2}{7}, \frac{3}{4}, \frac{4}{7}$, togither, you muste fyrste adde the $\frac{1}{3}$ and $\frac{2}{7}$ together, accordynge to the doctrine of the laste rule, and you shall finde $\frac{7}{9}$: then adde $\frac{3}{4}$ and $\frac{4}{7}$ togither by the saide last chapter, and they make $\frac{37}{28}$. Then finally adde the $\frac{7}{9}$ (whiche came of the $\frac{1}{3}$ and $\frac{2}{7}$ added together) with $\frac{37}{28}$, & you shall fynde by the forsaide addition that they amounte vnto $\frac{326}{120}$. Wherfore diuide 326. by 120. & therof cōmeth 2. and 86. remaineth whiche is $\frac{86}{120}$ of one whole, & thei being abreuied do make $\frac{43}{60}$: & thus the $\frac{1}{3}, \frac{2}{7}, \frac{3}{4}, \frac{4}{7}$, added together dos amount to 2. $\frac{43}{60}$,

as

as here vnder doth appere.





¶ Addition of broken numbers of broken.

3. Furthermore, if you will adde the broken numbers of broken together, as to adde the $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{4}{5}$ with the $\frac{5}{6}$ of $\frac{1}{2}$ of , :firſt you muſt reduce the nũbers accordyng to the order of ỹ fourth reduction, in multiplying the numerator of the fyrſt 3. fractions, the one by the other, and of the producte make your numerator, & likewiſe you muſt multiplie ỹ denominators of the foreſaid thre fractions, the one by the other and

and of the product make your denominator, and you shal finde $\frac{24}{60}$ for the first three broken numbers, which being abbreuied do make $\frac{2}{5}$, then reduce the other 3. fractiõs, by the said fourth reduction, in multiplying the numerators by numerators, & denominators, by denominators, as you did by the first 3. broken numbers, & you shal finde $\frac{25}{96}$ then must you adde $\frac{2}{5}$ whiche came of the fyrste 3. broken numbers, & $\frac{25}{96}$ whiche are of the last 3. fractions, both togither, by the instruction of ỹ first additiõ & you shall find $\frac{317}{480}$ whiche cannot be abreuied, but is the product of ỹ addition: so muche are the $\frac{1}{3}$ of $\frac{1}{4}$ of $\frac{4}{5}$ added with the $\frac{5}{6}$ of $\frac{1}{2}$ of $\frac{5}{8}$ as hereafter by practise doth euidently appere.

24. 25.

$\frac{2}{3}$ $\frac{3}{4}$ $\frac{4}{5}$ $\frac{5}{8}$ $\frac{1}{2}$ $\frac{5}{8}$

60. $\frac{2}{5}$ 96.

317

192 $\frac{4}{5}$ 125 $\frac{25}{96}$ $\frac{317}{480}$.

480.

Addi.

¶ Addition of broken number the partes of broken together.

4. Likewise if you will addde the $\frac{2}{3}$, and the $\frac{1}{2}$ of $\frac{1}{3}$ with the $\frac{4}{5}$ and $\frac{1}{4}$ of $\frac{1}{5}$, you muſt reduce the $\frac{2}{3}$ $\frac{1}{2}$ by the fyft reduction and therof cõmeth $\frac{1}{6}$ for the $\frac{1}{2}$ & $\frac{1}{3}$, of one of the ſaide thirdes, then reduce the $\frac{4}{5}$ and $\frac{1}{4}$ by the ſaide fift reduction, and thereof commeth $\frac{17}{20}$.

Laſt of all adde the $\frac{1}{6}$ and $\frac{17}{20}$ togither according to the firſte rule of addition, and you ſhall fynde $\frac{201}{120}$ which beinge diuided bringeth 1. & $\frac{81}{120}$ part remaining, whiche abreuied maketh $\frac{41}{60}$ and thus you doe perceaue that the $\frac{2}{3}$ & $\frac{1}{2}$ added with the $\frac{4}{5}$ and $\frac{1}{4}$ doe amounte vnto 1. $\frac{41}{60}$ as hereafter by practiſe doth plainly appere.

202

100 \ / 102

$\frac{5}{6}$ / \ $\frac{17}{30}$

120

18

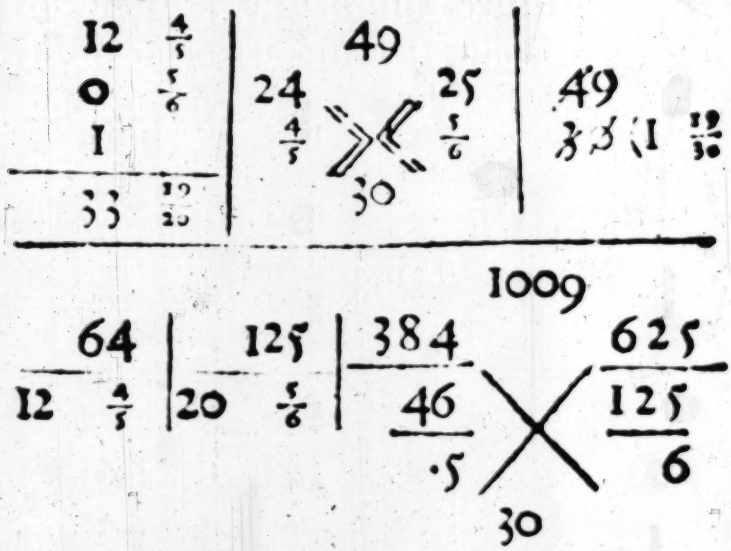
202

120.($1\frac{47}{60}$.

¶ Addition of whole nomber and broken together.

5. Also if you will adde. 12. $\frac{4}{5}$. with 20. $\frac{5}{6}$, you maie (if you will) adde. 12. and. 20. together, and thei make. 32. and then adde the twoo broken nombers together, that is to saie $\frac{4}{5}$. and $\frac{5}{6}$. by the order of the firste addition, and thei make $\frac{49}{30}$: therefore diuide 49. by 30. and thereof commeth 1. and $\frac{19}{30}$ partes remaine, whiche. 1. you must adde vnto the. 32 and the whole additiõ wil be. 33. $\frac{19}{30}$, or other wise, you maie reduce 12. $\frac{4}{5}$. into the likenesse of a fraction by the firt reduction, and thei will bee $\frac{64}{5}$, and likewise by thesame reduction, reduce. 20. $\frac{5}{6}$. and thei be $\frac{125}{6}$, then adde $\frac{64}{5}$ with the $\frac{125}{6}$, by the firste addition, and you shall finde. $\frac{1009}{30}$. Therefore diuide 1009. by. 30. and thereof commeth $\frac{19}{30}$.

as before, and as by practiſe of the ſame both the wales, doeth here vnder appeare.

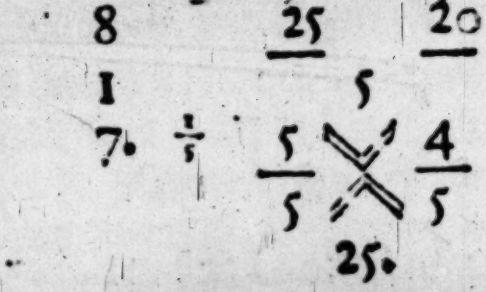


¶ The.v. Chapiter treateth of Subſtraction in broken nombers.

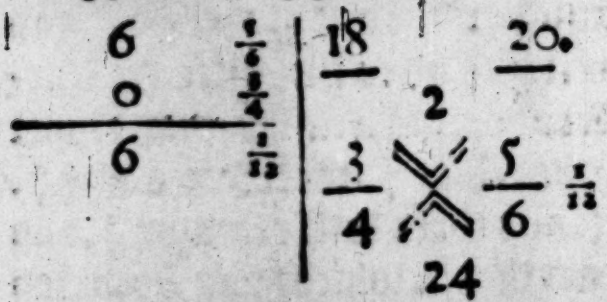
IF you will ſubſtracte $\frac{2}{3}$ from $\frac{3}{4}$ you muſt firſte reduce both the fractions into a common denomination by the fyrſt reduction, and you ſhall finde $\frac{8}{12}$ for the $\frac{2}{3}$, and $\frac{9}{12}$ for the $\frac{3}{4}$. Therefore abate the numerator 8. from the numerator 9. and there remaineth $\frac{1}{12}$ as may appere here by practiſe.

2. But if you haue a broken nõber, to bee subtracted from a whole nomber, you must borow one of the whole nomber, and resolue it into a fraction of like denomination, as is the fraction, which you would abate from the same whole nomber, and then abate the saied fraction there from, and you shall finde what doeth remaine, as by this example. If you abate $\frac{4}{5}$ from. 8. you must borowe out of the said. 8. and resolue it into fiftes like vnto the fraction, because it is 4. fiftes, that. 1. will bee 5. fiftes thus $\frac{5}{5}$. therefore abate $\frac{4}{5}$. from $\frac{5}{5}$. and there will remaine $\frac{1}{5}$, and subtract that. 1. whiche you borowed from 8. and there doeth remain. 7. and also the $\frac{1}{5}$. Thus the $\frac{4}{5}$ being subtracted frõ. 8. doeth leaue. 7. $\frac{1}{5}$. as by prac-

tise doeth plainly appere



3. If you will substract broken nomber, from whole nomber, and broken beyng together: thus, as if you would substract 3/4. from 6. 5/6, you mate by the first substraction, abate 3/4. from 5/6, and there will remaine 1/12, and the 6. doeth still remaine whole, because that 5/4. beyng abated from 6. 5/6. leaueth 6. 1/12. as appeareth by practise.



Likewise if you will abate 2/5, from 14. 2/5, you muste firste reduce. 14. 2/5. all into fiftes by the. 6. reduction, and thei be

bee $\frac{72}{5}$, then reduce $\frac{2}{3}$. into a common denomination, by the firste reduction, and you shall finde $\frac{10}{15}$. for the $\frac{2}{3}$: and $\frac{216}{15}$ for the $\frac{70}{5}$: then substracte the numerator. 10. of the firste fraction, from the numerator. 216. of the seconde fractiō, and there remaineth $\frac{206}{15}$. Therfore diuide 206. by. 15. and thereof commeth 13. $\frac{11}{15}$, and so muche remain of this substraction, as maie appeare.

$$\frac{10}{206} \qquad \frac{216}{}$$

$$\frac{72}{14 \quad \frac{2}{3}}$$

$$\frac{2}{3} \qquad \frac{72}{5}$$

15

1
~~2~~1
~~1~~5
~~9~~~~0~~~~6~~
~~1~~~~5~~~~5~~ (13. $\frac{11}{15}$.
~~1~~

4. If you will substracte whole nōber and broken, from whole and bro-

ken, as thus, if you will substract. 9 $\frac{1}{4}$. from. 20. $\frac{1}{2}$. you must reduce. 9. $\frac{1}{4}$. into fowerthes, and like wise the. 20 $\frac{1}{2}$. into halfes by the first reductiõ: and you shall find $\frac{37}{4}$ for the. 9. $\frac{1}{4}$. And $\frac{41}{2}$. for the 20. $\frac{1}{2}$. Then reduce $\frac{37}{4}$ and $\frac{41}{2}$ into one denominatiõ, accordyng vnto the first reduction and you shall finde $\frac{74}{8}$ for the $\frac{37}{4}$, and $\frac{164}{8}$ for the $\frac{41}{2}$ thã abate the numerator of $\frac{164}{8}$ and there remaineth $\frac{90}{8}$ then diuide 90. by 8. and thereof commeth 11. $\frac{1}{2}$ whiche is the remaine of this substraction.

$\frac{37}{4}$ $\frac{41}{2}$ $\frac{74}{90}$ $\frac{164}{8}$

9. $\frac{1}{4}$ 20 $\frac{1}{2}$

37 41

4 2

8

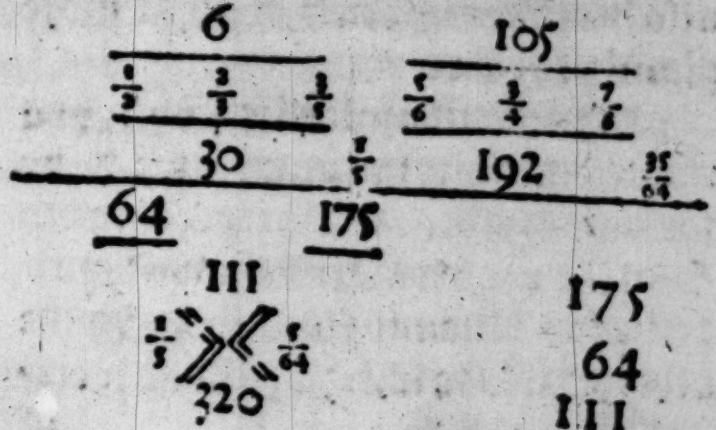
164 42

74 88

90 88 (11 $\frac{2}{4}$

¶ Substraction of broken nombers of broken.

5. If you will substracte, the $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{5}$. from the $\frac{5}{6}$. of $\frac{3}{4}$. of $\frac{7}{8}$, you muste firste bryng the $\frac{1}{2}$. of $\frac{2}{3}$. of $\frac{3}{5}$. into one fraction by the. 3. reduction, and the $\frac{5}{6}$ of $\frac{3}{4}$ of $\frac{7}{8}$ likewise into one fraction by the same reduction, and you shal finde $\frac{6}{30}$. for the firste. 3. broken nombers, whiche beyng abreuied dooe make. $\frac{1}{5}$: and for the other 3. broken nombers, you shall finde $\frac{105}{192}$: whiche beyng likewise abreuied dooe make $\frac{35}{64}$, then you shall substracte $\frac{1}{5}$. from. $\frac{35}{64}$. by the instruction of the firste substraction, in reducyng bothe the fractions into a common denomination, as before is dooen, and you shall finde remainyng $\frac{111}{320}$, as maie appeare by example.



	6				105		
$\frac{1}{2}$	$\frac{2}{3}$	$\frac{3}{5}$		$\frac{5}{6}$	$\frac{3}{4}$	$\frac{7}{8}$	
	30		$\frac{1}{5}$		192		$\frac{35}{64}$
64			175				

111

$\frac{1}{5}$ $\frac{5}{64}$

320

175
64
111

¶ The sixt Chapiter is of multiplication in broken nombers.

FIrste, for to multiplie in broken nomber, there is a rule, whiche is thus, multiplie the numerator of the one fraction, by the numerator of the other. And then diuide that fraction if you maie, or els abreuiate it, and you haue dooen: but if there be whole nomber and broken together, you muste reduce the whole nombers into broken, and adde thereunto the numerator of his broke, and then multiplie, as is before saied, as also hereafter by examples shal more plainly appeare.

1. If you will multiplie $\frac{2}{3}$ by $\frac{3}{4}$, you muste multiplie the numerator. 2. by the numerator. 3. and therof commeth 6. for the numerator. Likewise multiplie the denominators thone by the other, that is to saie. 3. by. 4. and thereof

of commeth. 12. for the denominator, so that this multiplication commeth to $\frac{6}{12}$, whiche beyng abreuied doe make $\frac{1}{2}$. and so muche amounteth the multiplicatiō of the $\frac{2}{3}$. by $\frac{3}{4}$, as by practise.

$$\frac{6}{\frac{2}{3} \quad \frac{3}{4}} \qquad \frac{1}{2}$$

12.

2. Likewise, if you will multiplie a broken nomber by whole nomber, or whole nomber by broken, whiche is all one, as $\frac{4}{5}$. by. 18. or els. 18. by $\frac{4}{5}$, you must set. 1. vnder. 18. thus. $\frac{18}{1}$: and then multiplie. 18. by the numerator 4. and therof commeth. 72. the whiche diuide by the denominator. 5. and thereof cōmeth. 14. $\frac{2}{5}$. for the whole multiplication, or otherwise abate from. 18. his $\frac{1}{5}$. parte, whithe is. 3. $\frac{3}{5}$, and there remaineth. 14. $\frac{2}{5}$. as aboue.

$$\frac{72}{\frac{4}{5} \quad \frac{18}{1}}$$

5

~~2~~2
~~7~~~~2~~
~~8~~~~8~~ (14 $\frac{2}{5}$

18

$\frac{11}{1}$ $\frac{1}{5}$

5

3

~~1~~ ~~8~~ 18

~~5~~ (3. $3\frac{5}{5}$

$14\frac{2}{5}$

3. Also if you wil multiplie a whole nomber, by whole nomber & brokē, or els whole nomber & brokē by a whole nōber, whiche is all one. As by example. if you will multiplie. 15. by. 16. $\frac{3}{4}$. or els. 16. $\frac{3}{4}$ by. 15. First reduce. 16. $\frac{3}{4}$ all into fourthes, in multiplyng 16. by ẏ deneminator of $\frac{3}{4}$ whiche is 4. & therof commeth 64 whereunto adde the numerator. 3. & it maketh $\frac{67}{4}$, whiche multiplie by $\frac{15}{1}$, accordyng unto thinstruction of the laste example, and you shall find ẏ product of this multiplicatiō to be 251 $\frac{1}{4}$ as by practise doth here appere

67

16 $\frac{3}{4}$

1005

$\frac{15}{1}$ $\frac{67}{4}$

4

67

15

335

67

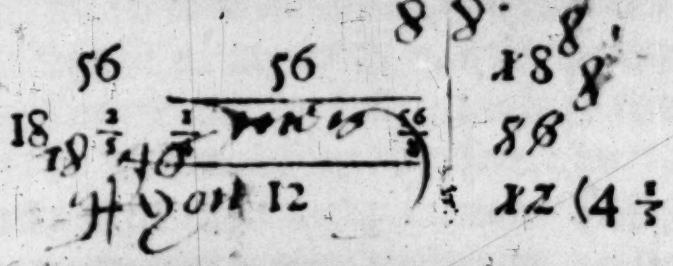
1005

And

ZI
POOS
AAA (251. $\frac{3}{4}$

4. And if you will multiple a broken nomber, by whole nomber and broken, or els whole noumber and broken by a broken. As by example, if you will multiplie $\frac{1}{4}$. by. 18. $\frac{3}{7}$, or els 18 $\frac{3}{7}$. by $\frac{1}{4}$, whiche is all one: you muste reduce the whole noumber into his broken by the firt reduction. And you shall finde. $\frac{56}{7}$, whiche you shall multiplie by the $\frac{1}{4}$, after the doctrine of the firft multiplication, that is to saie: in multiplying the numerator. 56. by the Numerator of $\frac{1}{4}$, which is 1. And it is still 56. because 1. doth neither multiplie nor deuide. And likewise you muste multiplie the Denominator. 3. by the Denominatour. 4. and it maketh. 12. then diuide. 56. by. 12. and thereof commeth. 4. $\frac{3}{7}$. And so muche amounteth

amounnteth the multiplication of the 17.$\frac{3}{5}$. multiplied by $\frac{1}{4}$. as by example.



5. If you will multiplie whole nõber and broken, with whole and broken, you muste firste put either whole nomber into his broken, accordyng to the instruction of the firste reduction, and [illegible] multiplie the one numerator by the other, and of the produce make your numerator. And likewise multiplie the denominators, the one by the other, and thereof make the denominator, then diuide the numerator, by the denominator, and the quotient shalbe the encrease of this multiplication.

¶ Example.

If you would multiplie. 12.$\frac{4}{7}$. by 6. $\frac{3}{4}$: firste by the firste reduction, the. 12.$\frac{4}{7}$

will

will make $\frac{64}{5}$, and the. 6. $\frac{3}{4}$. will make $\frac{27}{4}$ then multiplie the numerator. 64. by the numerator. 27. and thereof commeth. 1728. for the numerator. And then you must multiplie the denominator. 5. by the denominator. 4. and thei doe make. 20. then diuide. 1728. by. 20. and thereof commeth. 86. $\frac{2}{5}$. for the whole multiplicatiõ, as by exãple.

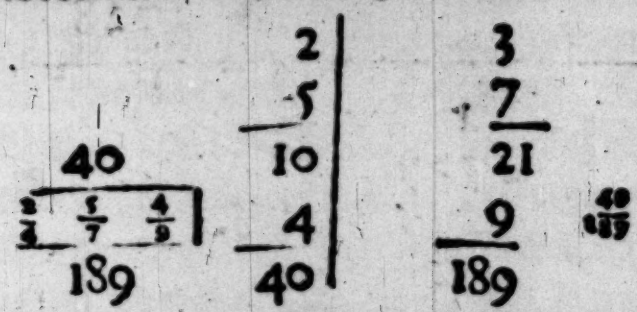
	1728		64
	64	27	27
12	$\frac{4}{5}$	$6\frac{3}{4}$	448
	20		128
			1728

18

1
1728
200 (86.
2

6. If you will multiplie one broken nomber by many broken nombers, thus: As to multiplie $\frac{2}{3}$. by $\frac{5}{7}$. and by $\frac{4}{9}$: you muste multiplie the numerators of all the fractions, the one by the

the other, and of the product make the numerator, that is to saie: 2. by. 5. and thei be. 10. then. 10. by. 4. and thei bee 40. for the numerator. Likewise you muſt multiplie the denominators, the one by the other, that is to saie. 3. by. 7. maketh. 21. then. 21. by. 9. maketh. 189 for the denominator: then sette. 40. ouer the. 189. with a line betwene thē, and thei make $\frac{40}{189}$. And so muche as mounteth the whole multiplication of the $\frac{2}{3}$, multiplied by $\frac{5}{7}$ and $\frac{4}{9}$, as by example folowyng. And thus is to be vnderstande of all suche like.



¶ The. vii. Chapiter treateth of diuision in broken nombers.

NOte, that in diuision of broken nombers, you muste sette your

your diuisor downe ſtrike, nexte vnto the lefte hande, and the diuidende or nomber, whiche is to bee diuided alwaies towarde the right hande.

And then multiplie croſſe wiſe, that is to ſaie, the numeratour of youre Diuiſour by the Denominator of the Diuidende, and the producte ſhalbee the Denominatour, whiche afterwarde ſhall bee your Diuiſour. And likewiſe you muſte multiplie the Denominatour of your firſte nomber, that is to ſaie of your Diuiſour: By the Numeratour of the Diuidende, whiche afterwarde ſhall bee the Diuidende, and that muſte bee ſette ouer the Croſſe, and the Denominatour vnder the Croſſe, then ſhall you diuide the Numeratour by the Denominatour, if any maie bee diuided, if not, you muſte abbreuiate theim, as hereafter by examples ſhall more plainly appeare.

1. If you will diuide $\frac{3}{4}$. by $\frac{2}{3}$, you muſte ſette the Diuiſour (whiche is $\frac{2}{3}$)

$\frac{2}{3}$) nexte to the lefte hande, and the diuidende $\frac{3}{4}$. towarde your right hande, with a crosse betwene them: as maie appere by this crample in the margente. Then you shall multiplie the numerator of the $\frac{2}{3}$, whiche is. 2. by the denominator of the $\frac{3}{4}$. which is 4. and thereof commeth. 8. which shalbe your newe diuisor: set that. 8. vnder the crosse, as the denominator, then multiplie the numerator of the diuidende, that is to saie, of the $\frac{3}{4}$ whiche is 3. by the denominator of the diuisour, that is to wit, of the. $\frac{2}{3}$. whiche is. 3. set that ouer the crosse, and it is. 9. for the numerator, whiche shalbe now the diuidende, or nōber to be diuided. Then finally, you shall diuide. 9. by. 8. and thereof commeth into the quotient. 1. $\frac{1}{8}$ and so often times is $\frac{3}{4}$. conteined in $\frac{2}{3}$, as dooeth appeare before in the margente. But in case you would diuide $\frac{2}{3}$. by. $\frac{3}{4}$, you muste likewise sette your

diuisor

diuisor $\frac{3}{4}$ nexte to your left hande, as is before said. And then procede, as is aboue declared, & you shall finde that $\frac{2}{3}$ diuided by $\frac{3}{4}$ bringeth into the quotient $\frac{8}{9}$, whiche can not be diuided nor abbreuied, wherfore it appereth that $\frac{2}{3}$ diuided by $\frac{3}{4}$ bringeth but $\frac{2}{3}$ of one vnitie into the quotient as doth appere.

2. Likewise if you will diuide a broken number by a whole number, or els a whole number by a broken, as to diuide $\frac{1}{4}$ by 13. you shall put 1. vnder 13. and it will be $\frac{13}{1}$ which is your diuisor, set it toward your left hande, and then multiply 13. by 4. according to the first diuision, & therof commeth 52. for the de-

nominator, set that vnder ẏ crosse & multiply 3. by 1. which is 3. for the numerator, that set ouer the crosse, and it is $\frac{3}{52}$ as appeareth in the margent. But if you will diuide 13. by $\frac{3}{4}$ then set the $\frac{3}{4}$ nexte your left hand and put one vnder 13. as in the last example, & it is $\frac{13}{1}$ set ẏ toward your right hande thus, as appeareth in the margent, and then worke according to ẏ doctrine of the first diuision, & you shall finde that 13. being diuided by $\frac{3}{4}$ bringeth into ẏ quotient $\frac{52}{4}$, then diuide 52. by 3. and therof commeth 17. $\frac{1}{3}$, and so oftentimes is $\frac{3}{4}$ conteined in 13. as doth appere.

52

$\frac{3}{4}$ $\frac{13}{1}$

3

~~2~~ 1

~~8~~ ~~2~~

~~8~~ ~~3~~ (17. $\frac{1}{3}$

3. And if you wil diuide whole nūber by whole number and broken, or els whole nūber and broken by whole number, as to diuide 20. by 5. $\frac{5}{6}$; you shall reduce 5. $\frac{5}{6}$ into his broken by ẏ first reduction, & it maketh $\frac{35}{6}$ for your

diui-

diuisor, then put 1. vnder 20. And it wyll bee $\frac{20}{1}$, then shall you multiply 35. by 1. and 20. by 6. as is taught in the other diuisions, and you shall finde $\frac{210}{1}$: then diuide 12. by 35. and you shall fynde in your quotient 3. $\frac{1}{5}$ € so many tymes is 5. $\frac{1}{2}$ conteined in 20. as in the margent doth appere.

	120	
$\frac{25}{6}$	35	20 / 1
	35	
	1	
	35	
	x Z ø	(3. $\frac{1}{5}$
	x x	

But if you will diuide 5. $\frac{1}{2}$ by 20. you must diuide 35. by 120. which you can not, wherefore you shall abbreuiate $\frac{35}{120}$, and thereof commeth. $\frac{7}{24}$.

4. If you will diuide a broken number by whole number and broken, or els a whole number and broken, by a broken number. As to diuide $\frac{1}{4}$ by 13. $\frac{1}{3}$, you muste reduce 13. $\frac{1}{3}$, into hys broken, by the syxte reduction

And they be $\frac{41}{3}$ for your diuiſor, then multiplye 41. by 4. & they make 164. for your denominator, likewiſe multiplye 3. by 3. and they make 9. for the numerator, and then will your ſume be $\frac{9}{164}$. But yf you will diuide 13. $\frac{2}{3}$ by $\frac{1}{4}$ then you muſt diuide 164. by 9. and you ſhall fynde 18. $\frac{2}{9}$.

5. If you will diuide whole number and broken, by whole number & broken, as to diuide 7. $\frac{3}{4}$ by 13. $\frac{2}{3}$ you muſt reduce the whole numbers into their broken, by the doctrine of the firſt reduction, & you ſhall fynde $\frac{31}{4}$ for the 7. $\frac{3}{4}$, & $\frac{41}{3}$ for the 13. $\frac{2}{3}$.

Then ſett downe $\frac{41}{3}$ towarde the left hande by cauſe it is your diuiſor, and the $\frac{31}{4}$ towarde the right hande, and multiplie 41. by 4. for your denominator, and thereof commeth 164. Likewiſe multiplie 31. by 3. for your numerator, and it amounteth to 93. the whiche diuiſion will be thus $\frac{93}{164}$ as before

$$\frac{41}{3} \times \frac{31}{4} = \frac{93}{164}$$

both

doth appere.

But if you will diuide $13\frac{2}{3}$. by $7.\frac{3}{4}$ you muste contrariwyse to the other example, diuide 164. by 93. and you shall fynde in the quotient $1.\frac{71}{93}$.

6. The broken numbers of broken, muste be diuided in suche maner as broken numbers are, & there is no difference, sauing onely that of many broken numbers you must make but two broken numbers, that is to saye ẏ diuisor, and the diuidend, or number that is to be diuided, example. If you will diuide the $\frac{3}{4}$ of $\frac{3}{5}$ of $\frac{1}{2}$, by the $\frac{2}{3}$ of $\frac{4}{7}$. For the fyrst, the $\frac{3}{4}$ of $\frac{3}{5}$ of $\frac{1}{2}$ are $\frac{9}{40}$ by the thirde reduction: and the $\frac{2}{3}$ of $\frac{4}{7}$ are by the same Reductiō $\frac{8}{21}$, then haue you $\frac{8}{21}$ for your diuisor, & $\frac{9}{40}$ for your nūber to bee diuided, then multiply 8. by 40. which maketh 320. set that vnder the crosse and multiply 9. by 21: & thereof cōmeth 189. which set ouer the crosse for the numerator, and they

$$\frac{8}{21} \quad \begin{array}{c} 189 \\ \swarrow \quad \nearrow \\ \searrow \quad \nwarrow \\ 320 \end{array} \quad \frac{9}{40}$$

make $\frac{189}{320}$ for this diuision as doth appere.

But if you woulde diuide $\frac{1}{21}$ by $\frac{9}{20}$ you muste worke contrary to the laste example, that is to saye, you muste diuide 320. by 189. And thereof commeth in the quotient $1.\frac{131}{189}$.

¶ The eyght Chapter treateth of duplation, triplation, and quadruplation of all broken numbers.

IF you wyll double any broken number, you shall diuide ỹ same by $\frac{1}{2}$: likewise if you wyll triple any fraction you muste diuide it by $\frac{1}{3}$. And for to quadruple any broken nũber, you shall diuide it by $\frac{1}{4}$, and so is to be vnderstande of all other.

Example of duplation.

IF you will double $\frac{3}{5}$ you shal diuide $\frac{3}{5}$ by $\frac{1}{2}$, and thereof commeth $\frac{6}{5}$, which being abbreuied are $\frac{1}{1}$: as by example.

Or otherwise, in case the denominator of any fraction bee an euen number, you may take halfe the sayde denominator, without anye other operation, and the numerator to abyde still ẏ numerator, vnto the said halfe of the denominator of the Fractiõ, as by the other exãple before rehearsed: that is to say of $\frac{1}{8}$, take $\frac{1}{2}$ of 8. which is 4. and that is the denominator, and $\frac{1}{5}$. remaineth still numerator to 4. and it maketh $\frac{3}{4}$ and so of all other. But in case the denominator bee an odde nomber, that is to say, not euen, then you may multiply the numerator by 2. or els double ẏ numerator, whiche is al one thing, and that fraction shall bee doubled. Example, if you will double $\frac{3}{5}$ you must onely multiply the numerator 3. by 2. & they be 6. whiche maketh that fraction to be $\frac{6}{5}$, the which 6. being diuided by 5. bringeth 1. $\frac{1}{5}$ and so much is the double of $\frac{3}{5}$.

Example of Triplation.

If you will triple ⅔ you muste diuide ⅔ by ⅓ and thereof commeth ⅔ whiche beinge diuided bringeth 1⅓, or otherwise, bicause the denominator is an odde number you maye multiplie the numerator 3. by 3. and therfore commeth 9. which maketh ⅔ as before.

Example of quadruplacion.

If you will quadruple ¼, you shall diuide ¼ by ¼ and thereof commeth ⅘ which 16. being diuided by 5. bringeth 3⅕, or otherwise, bicause the denominator of the fraction is an odde nũber, you shall multiplie the numerator of the ¼ that is to say 4. by 4. and therof commeth 16. the whiche diuide by 5. and you shall finde 3. ⅕ as before, and this sufficeth for duplacion, triplacion and quadruplacion.

¶ The 9. Chapter treateth of the proofes of broken numbers. And first of Reduction.

If

IF you doe abbreuiate ye broken nũbers whiche bee reduced, you shall retourne them into their firste estate: as by example, if you reduce $\frac{2}{3}$ wyth $\frac{4}{5}$ you shall synde $\frac{10}{15}$ and $\frac{12}{15}$, then abbreuiate $\frac{10}{15}$ and you shall synde $\frac{2}{3}$, abbreuiate likewise $\frac{12}{15}$ and thereof commeth $\frac{4}{5}$ as before.

The proofe of Abbreuiation.

IF you doe multiplie that number whiche you haue abbreuied by that or those numbers, by the whiche you haue abbreuied them, you shall retorne them againe into their firste estate. Example, if you wyll abbreuiate $\frac{32}{48}$ by 16. in takyng ye $\frac{1}{16}$ part both of the numerator, and also of the denominator, you shall finde $\frac{2}{3}$, ye proufe is thus, you must multiplye bothe the numerator & denominator of $\frac{2}{3}$ by 16. that is to say, thrise by 16. maketh 48. for the denominator, & 2. by 16. maketh 32. for the numerator, then set the numerator 32. ouer the denominator 48

and

and they be $\frac{32}{48}$ as before.

The proofe of Addition.

If you doe substract one of the nũbers, or manye of them (which you haue added) from the totall summe, there shal remaine the other, or others. Example: if you do adde $\frac{1}{3}$ with $\frac{1}{4}$ you shall fynde $\frac{7}{12}$. The proofe is, is if you substract $\frac{1}{3}$ from $\frac{7}{12}$ you shall fynde remaining the other number whiche is $\frac{1}{4}$, or els yf you doe substract $\frac{1}{4}$ frõ $\frac{7}{12}$ there will remaine the other nomber, which is $\frac{1}{3}$.

The proofe of Substraction.

If you do adde that number whiche remaineth, with the nomber whyche you did substract, you shall fynde the totall summe, oute of the which you made ẏ abatemẽt: or otherwise, if you adde the two lesser nõbers togither, you shall finde the greater. Examplet

if

if you doe abate or substracte $\frac{1}{4}$ from $\frac{1}{3}$ there will remaine $\frac{1}{12}$. The proofe is thus: you muste adde $\frac{1}{12}$ & $\frac{1}{4}$ togither, and you shall synde $\frac{1}{3}$, whiche is the greateste nomber.

The proofe of multiplication.

If you divide the produte of the whole multiplication, by the multiplicator, you shal synde in your quotient, the multiplicande or nomber by the which you have multiplyed: or els if you divide the totall sõme which is come of the multiplication, by the multiplicande: you shall finde in the quotiẽt the multiplicator. Example, if you multiply ^{2} by $\frac{4}{5}$, the produt of this multiplication will bee $\frac{8}{15}$. The proofe is thus: you shal divide $\frac{8}{15}$ by $\frac{4}{5}$ multiplicator $\frac{4}{5}$, and therof cõmeth $\frac{2}{3}$. Or els divide $\frac{8}{15}$ by $\frac{2}{3}$ & you shall finde the $\frac{4}{5}$ which is the multiplicator.

The proofe of Division.

If

If you doe multiplye the quotient by the diuisor, you shall finde the number which you did diuide, that is to say, your diuidende. Example: if you diuide $\frac{2}{3}$ by $\frac{1}{4}$, your quotient will bee $\frac{8}{9}$ the proofe is thus, you must multiply $\frac{8}{9}$ by $\frac{3}{4}$, and thereof commeth $\frac{24}{12}$ whiche being abbreuiated are $\frac{2}{3}$ whiche is your diuidende, & by this maner all whole numbers haue their proofes as well as broken numbers.

¶ The tenth Chapter treateth of certaine questions done by broken numbers. And first by Reduction.

FInde twoo numbers, whereof the $\frac{3}{7}$ of the one number may bee egal vnto the $\frac{3}{5}$ of the other. Answere: you shall reduce $\frac{3}{7}$ & $\frac{3}{5}$ crossewise, and you shall finde 16. ouer the $\frac{3}{7}$ and 21. ouer the $\frac{3}{5}$, whiche are the two numbers that you seeke: for the $\frac{3}{7}$ of 16. are 6. and so are the $\frac{3}{5}$ of 21. likewise 6. wherefore you may perceiue that the

the

the $\frac{3}{8}$ of 16. which are 6. are egall vnto the $\frac{2}{7}$ of 21. whiche is alſo 6.

2. Finde twoo numbers, whereof the $\frac{2}{3}$ of the one may be double to the $\frac{1}{4}$ of the other. Aunſwere: double $\frac{1}{4}$ & you ſhal haue $\frac{2}{4}$, which being abbreuiated is $\frac{1}{2}$: thē reduce $\frac{3}{1}$ & $\frac{1}{2}$ croſſewiſe, & you ſhall finde 4. ouer the $\frac{3}{1}$ & three ouer the $\frac{1}{2}$ which are the two numbers that you ſeeke. For the $\frac{3}{1}$ of 3. which is 2. is double vnto the $\frac{2}{4}$ of 4. which is but 1.

3. Finde two numbers whereof the $\frac{1}{3}$ and the $\frac{1}{4}$ of the one, maye bee egall vnto the $\frac{1}{4}$ & $\frac{1}{7}$ of the other. Aunſwere: Adde the $\frac{1}{3}$ and $\frac{1}{4}$ togither, and they make $\frac{7}{12}$ then adde $\frac{1}{4}$ and $\frac{2}{7}$ togither, & they are $\frac{6}{20}$, then reduce $\frac{7}{12}$ & $\frac{9}{20}$ croſſewiſe, & you ſhall haue 140. ouer the $\frac{7}{12}$ & 108. ouer the $\frac{9}{20}$, whiche are the two nūbers that you ſeke. For 63. whiche are the $\frac{7}{12}$ of 108. are alſo the $\frac{9}{20}$ of 140.

4. Finde two numbers, whereof the $\frac{1}{5}$ the $\frac{1}{4}$ and the $\frac{1}{7}$ of the one of them, maye by egall vnto the $\frac{1}{7}$ the $\frac{1}{6}$ and $\frac{1}{7}$ of the other number. Aunſwere: firſt you

must

muſt adde $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{3}{4}$ togither, & they make $\frac{11}{12}$: then adde $\frac{1}{5}$, $\frac{1}{2}$ and $\frac{3}{7}$ togither, & they make $\frac{207}{210}$. Then reduce $\frac{11}{12}$ and $\frac{207}{210}$ croſſewiſe, as by the ſyxſte queſtion of reduction, and you ſhall finde 2730. ouer the $\frac{11}{12}$ and 1284. ouer the $\frac{207}{210}$, whiche are the twoo nombers that you ſeeke: for 1391 which is the $\frac{1}{3}$ the $\frac{1}{3}$ and $\frac{1}{4}$ of 1284. is lyke to the $\frac{11}{12}$ & $\frac{1}{2}$ of 2730, which is alſo 1391.

5. Finde thꝛee nombers, whereof the $\frac{2}{5}$ of the firſt, the $\frac{4}{7}$ of the ſeconde, & the $\frac{4}{9}$ of the thirde, maye be egall the one to the other. Aunſwere: ſet downe the $\frac{21}{17}$ and $\frac{4}{9}$, and then multiplie the Denominatoꝛ of the $\frac{2}{7}$ that is to ſaye 5. by the Numeratoꝛs of the other twoo Fractions, that is to ſaye, by the Numeratoꝛ of $\frac{3}{7}$, and by the Numeratoꝛ of $\frac{4}{9}$, whiche is 3. and 4. And thereof commeth 60. foꝛ your ſyxſte nomber, then ſhall you multiplye the Denominatoꝛ of the $\frac{3}{5}$ whiche is 7. by the Numeratoꝛs of $\frac{1}{5}$ and $\frac{4}{9}$, that is to ſay by 2. and 4. and thereof commeth 56.

foꝛ

for the seconde number. Then multiplie the Denominator of $\frac{4}{9}$, that is 9. by the Numerators of $\frac{2}{5}$ and $\frac{3}{7}$ that is by 2. and by 3. and thereof commeth 54. for the third nomber.
And thus the $\frac{2}{5}$ of 60. which is 24. is likewise the $\frac{3}{7}$ of 56. whiche is the second nomber. and the $\frac{4}{9}$ of 54. whiche is the thirde nomber.

6. Finde three nombers, of whiche the fyrste and the seconde maye bee in suche proportion as $\frac{1}{2}$ and $\frac{1}{3}$, and the seconde and thirde in suche proportion as $\frac{1}{4}$ and $\frac{1}{5}$. Aunswere: reduce $\frac{1}{2}$ and $\frac{1}{3}$ crossewise, and you shall haue 3. ouer the $\frac{1}{2}$ and 2. ouer the $\frac{1}{3}$, then reduce $\frac{1}{4}$ and $\frac{1}{5}$ in lyke maner, and you shall fynde 5. ouer the $\frac{1}{4}$ and 4. ouer the $\frac{1}{5}$. Then say by the Rule of three, if 5. do gyue me 4. what shall twoo gyue me, whiche is the seconde proportionall, multiply the seconde nomber 4. by the thyrde nomber twoo, and thereof commeth eyght, the whiche diuide

by

by the firſt number 7. and therof commeth 1. $\frac{1}{7}$ for the third proportionall, and you ſhal fynde that 3. 2. 1. $\frac{1}{7}$ are the three numbers proportionall that I demaunde, or elſe 15. 10. & 8. in whole numbers.

1. What number is that, vnto the whiche if you doe adde 13. the whole amounteth to 31. Anſwere: rebate 13. from 31. and there wyll remaine 18. which is the number that you ſeeke.

2. What number is that, vnto the whych if you adde $\frac{2}{7}$ the addition wyll be $\frac{5}{6}$. Anſwere: abate $\frac{2}{7}$ from $\frac{5}{6}$, and there will remaine $\frac{11}{30}$, whyche is the number that you deſire.

3. What number is that, whereunto if you adde 7. $\frac{2}{7}$, the whole addition will be 12. $\frac{1}{2}$. Anſwere: abate 7. $\frac{2}{7}$ frō 12. $\frac{1}{2}$. & the remaine will be 4 $\frac{7}{13}$ which is the number y^{t} you deſire to knowe.

4. What number is that, wherevnto if you adde the $\frac{1}{3}$ of it ſelfe, that is to ſay, of the nūber that your ſeeke, the whole addition may be $\frac{5}{6}$.

Anſwere:

Aunſwere: Here followeth a generall rule for all ſuche like queſtions. Firſt, of 3. whiche is the numeratour of $\frac{3}{4}$. make ſtill the numeratour, and likewiſe of 3. and 4. together, whiche is bothe the numerator, and the denominator of the $\frac{3}{4}$. make your denominatour, ſo your ſhall finde $\frac{3}{7}$, then take the $\frac{3}{7}$ of $\frac{5}{6}$, whiche is $\frac{15}{42}$, or $\frac{5}{14}$ and ſubſtracte them from $\frac{5}{6}$, and there will remaine $\frac{20}{42}$, whiche is the number that you ſeke.

5. What nomber is that, unto the whiche if you adde his owne $\frac{3}{7}$. that is to ſaie $\frac{3}{7}$. of it ſelf, the whole addition ſhall bee. 20. Aunſwere: Done as in the laſte queſtion: of the numeratour of $\frac{3}{7}$ that is to ſaie, of. 2. make ſtil your numerator, And likewiſe of the numerator. 2. and the denominator. 3. of the $\frac{3}{7}$, make of them bothe, your denominator, and you ſhall finde $\frac{3}{7}$, then take the $\frac{3}{7}$. of. 20. whiche are. 8. And abate them from. 20. and there will remain 12. whiche is the nomber that you ſe-

fire, and so is to bee doone of all suche like reasons.

1. What nomber is that, from the whiche if you doo abate. 17. the reste maie bee. 19. Aunswere: adde. 17. and 19. together, and you shall finde. 36. whiche is the nomber that you seke.

2. What nomber is that, from the whiche if you abate $\frac{3}{5}$, the reste maie bee $\frac{1}{8}$. Aunswere: adde $\frac{3}{5}$ and $\frac{1}{8}$ together, and you shall finde $\frac{29}{40}$, whiche is the nomber that you demaunde.

3. What nomber is that, from the whiche if you deduct. 13. $\frac{1}{2}$ the reste maie be. 5. $\frac{5}{7}$. Aunswere: adde. 13. $\frac{1}{2}$ and. 5. $\frac{5}{7}$. together, and there ek commeth. 19. $\frac{3}{14}$ whiche is the nomber that you seke.

4. What nomber is that, from the whiche if you substracte his $\frac{2}{7}$, the reste maie bee. 12. Aunswere: and a rule for suche like reasons, that is to saie, from the denominator of $\frac{5}{2}$. whiche is. 5. abate. 2. whiche is his numerator, and there resteth. 3. for the denominator, and thus of $\frac{3}{7}$. you haue you made $\frac{3}{7}$,

A rule.

then

then take the $\frac{3}{4}$ of.12. whiche are 8. and adde them vnto.12. and therof cõmeth 20. for the nomber whiche you desire.

5. What nomber is that, from the whiche if you doe abate his $\frac{1}{2}$, the reste maie bee $\frac{3}{5}$. Aunswere: from the denominator of $\frac{3}{4}$, whiche is. 4. subtracte his numerator. 3. and there resteth. 1. Thus of $\frac{3}{4}$. you haue made. $\frac{3}{1}$. Then multiplie $\frac{1}{1}$ by $\frac{2}{5}$, and therof commeth $2.\frac{2}{5}$, the whiche adde vnto $\frac{2}{5}$, and you shall haue. $3.\frac{4}{5}$, whiche is the nomber that you seke.

6. What nomber is that, from the whiche if ye abate his $\frac{4}{7}$, the rest maie be.12. $\frac{3}{7}$. Aunswere: Doe as you did in the laste question, and you shall finde that the $\frac{4}{7}$. will bee $\frac{4}{1}$. And therefore multiplie.12. $\frac{3}{7}$ by $\frac{4}{1}$, and therefore commeth.50 $\frac{3}{7}$, the whiche adde vnto.12 $\frac{3}{7}$, and you shall finde.93. $\frac{1}{7}$, for the nomber that you demaunde. And thus of all like questions.

1. What nomber is that, which beyng multiplied by 13. the whole. Mul-

ſtiplication ſhal mounte to. 221. Aunſwere: diuide. 221. by. 13. and thereof commeth. 17. whiche is the nombre that you ſeeke.

2. What nomber is that, whiche beyng multiplied by. 15. the whole multiplication wil amount to $\frac{1}{4}$. Aunſwere: diuide $\frac{1}{4}$. by $\frac{15}{1}$. and thereof commeth $\frac{1}{60}$. whiche is the noumber, that you ſeeke.

3. What nomber is that; whiche beeyng multiplied by. 21. the whole multiplication will bee: 16. $\frac{4}{5}$. Aunſwere: diuide. 16. $\frac{4}{5}$. by. $\frac{21}{1}$, and you ſhall finde $\frac{4}{5}$, whiche is the nomber that you demaunde.

4. What nomber is that, whiche beyng multiplied by $\frac{3}{4}$: the multiplipplication will amounte to. 18. Aunſwere: diuide $\frac{18}{1}$ by $\frac{3}{4}$, and therof commeth. 24. whiche is the nomber that you deſire to knowe.

5. What nomber is that, whiche if it bee multiplied by $\frac{3}{5}$. the whole multiplication will bee. $\frac{1}{4}$. Aunſwere: di-

uide

uide $\frac{1}{4}$ by $\frac{2}{3}$. and the quotient will bee $\frac{3}{8}$, whiche is the nomber that you re-quire to knowe.

6. What nomber is that, whiche beyng multiplied by $\frac{1}{8}$, the product of that multiplication will bee. 16. $\frac{2}{3}$. Aunſwere: diuide. 16. by $\frac{1}{3}$. by $\frac{1}{8}$. and thereof commeth. 26. $\frac{1}{3}$, whiche is the nomber that you ſeeke.

¶ Here enſweth other neceſſarie queſtions, whiche are wrought by multiplication in bro-ken nombers.

I Demaunde howe muche the $\frac{1}{3}$ of. 20. ſhillynges are worth or what are the $\frac{1}{3}$. of. 20. ſhillynges. Aunſwere you muſte multiplie $\frac{1}{3}$ by $\frac{1}{4}$, and the product will bee $\frac{100}{8}$, therefore diuide. 100. by. 8. and thereof commeth. 12. $\frac{1}{2}$, whiche is to ſaie. 12. ſhillynges. 6. pence, and ſo muche are the $\frac{1}{4}$. of. 20. ſhillynges worthe.

2. I demaunde what the $\frac{3}{4}$ of $\frac{5}{6}$ of a pounde of money are worthe, that is to saie, of. 20. shillynges. Aunswere: multiplie. $\frac{3}{4}$. by $\frac{5}{6}$. And thereof commeth $\frac{5}{8}$. Then take the $\frac{5}{8}$ of 20. shillinges, as in the last questiō goyng before and you shall finde. 12. shillynges. 6. pence, and so muche are the $\frac{3}{4}$ of $\frac{5}{6}$, of 20 shillynges worthe.

3. I demaunde what the $\frac{2}{3}$ of. 8. pence $\frac{3}{2}$ are worth. Aunswere: multiplie. 8. $\frac{3}{2}$ by $\frac{2}{3}$, or els $\frac{2}{3}$ by. 8. & $\frac{3}{2}$ whiche is all one, and you shall finde $\frac{34}{6}$. Then diuide 34 by. 6. and your quotient will bee fiue pence $\frac{2}{3}$, and so muche are the. $\frac{2}{3}$. of. 8. pence $\frac{3}{2}$ worthe.

4. What are the $\frac{3}{4}$. of. 14. pence $\frac{5}{6}$. Aunswere: multiplie. 14. $\frac{5}{6}$ by $\frac{3}{4}$, and thereof commeth $\frac{219}{20}$. Therefore diuide 219. by. 20. and your quotiente will bee. 10. pence $\frac{19}{20}$, and so muche are the $\frac{3}{4}$ of. 14. $\frac{5}{6}$.

5. How many quarters of fowerth parties are contained in. 7. $\frac{2}{3}$. Aunswer multiplie. 7. $\frac{2}{3}$ by $\frac{4}{1}$ (because one whole

containeth

containeth. 4. quarters) and thereof commeth, 30. $\frac{2}{3}$, and so many quarters are in the. 7. $\frac{2}{3}$. that is to saie. 30. quarters, and $\frac{2}{3}$ of a quarter.

6. Howe many thirdes are in $\frac{3}{4}$ and $\frac{5}{8}$, that is to saie in. 3, quarters, and $\frac{1}{2}$ of one quarter, whiche are $\frac{7}{8}$ by the fifte reduction. Aunswere: multiplie $\frac{7}{8}$ by $\frac{3}{1}$ (for because that in one whole are cōtained. 3. thirdes) and thereof wil come $\frac{2}{3}$ and $\frac{5}{8}$ of a third, and so many thirdes are in $\frac{3}{4}$ and $\frac{1}{2}$ or in $\frac{7}{8}$, whiche is al one

¶ Questions doen by diuision in broken nomber.

What nomber is that, which beyng diuided by. 17. the quotiente will bee. 13. Aunswere: multiplie. 17. by. 13. And thereof commeth. 221. whiche is the nomber that you seke.

2. What nomber is that, which beyng diuided by $\frac{3}{4}$, the quotient will be 21. Aunswere: multiplie $\frac{21}{1}$. by $\frac{4}{3}$ and thereof cōmeth $\frac{63}{4}$. Then diuide. 63. by 4

and thereof commeth. 15. $\frac{3}{4}$, whiche is the nomber that you ſeke.

3. What nomber is that, which beyng diuided by. $\frac{1}{12}$, the quotiente will bee $\frac{2}{3}$? Anſwere: multiplie $\frac{2}{3}$. by $\frac{1}{12}$. and thereof commeth $\frac{2}{24}$, whiche beeyng abbreuiated are $\frac{1}{12}$, for the nomber, whiche you require.

4. What nomber is that, whiche beyng diuided by $\frac{4}{5}$. the quotient will be. 16. $\frac{2}{3}$? Anſwere: multiplie. 16. $\frac{2}{3}$, by $\frac{4}{5}$, and thereof commeth $\frac{200}{15}$. Therefore diuide. 200. by. 15. and thereof cõmeth. 13. $\frac{5}{15}$, whiche is the nomber that you deſire to finde.

5. What nomber is that, which beeyng diuided by. 13. $\frac{1}{12}$, the quotient will bee. 20. Anſwere: multiplie 20. by. 13 $\frac{1}{12}$ and thereof commeth $\frac{800}{12}$, then diuide 800. by. 3. and thereof commeth. 266 $\frac{2}{3}$ for the nomber, whiche you ſeke.

6. What nomber is that, whiche if it bee diuided, by. 12. $\frac{1}{12}$ the quotiente will be $\frac{7}{8}$? Anſwere: multiplie $\frac{7}{8}$ by. 12 $\frac{1}{12}$ and thereof commeth $\frac{371}{96}$ then diuide

175 by. 16. and thereof commeth. $10\frac{15}{16}$ for the nomber whiche you desire.

¶ Other necessarie questions dooen by diuision in broken nomber.

I Demaunde what parte. 30. is of. 70. Aunswer: diuide. 30. by 70. whiche you can not, for theiare $\frac{30}{70}$, but abreuiate them and thei are $\frac{3}{7}$. Thus. 30. are the $\frac{3}{7}$. of. 70.

2. I demaunde what parte. 10. is of $16\frac{2}{3}$. Aunswere: diuide. 10. by. $16\frac{2}{3}$, and thereof commeth $\frac{30}{50}$, whiche beyng abreuiated are $\frac{3}{5}$. And thus 10. is found to bee $\frac{3}{5}$ of. $16.\frac{2}{3}$.

3. More, what parte is. 25. of. $\frac{5}{8}$. Aunswere: diuide $\frac{5}{8}$. by. $\frac{25}{8}$, and thereof commeth $\frac{5}{200}$, whiche beyng abreuiated is. $\frac{1}{40}$. And thus. $\frac{5}{8}$. is but the $\frac{1}{40}$. of. 25.

4. More, $\frac{5}{6}$ what parte are thei of $\frac{7}{8}$ Aunswere: diuide $\frac{5}{6}$ by $\frac{7}{8}$, and you shal

finde $\frac{40}{63}$ whiche abbreuiated are $\frac{10}{21}$.

5. Woꝛke, $\frac{4}{7}$ what parte are thei of $13\frac{1}{7}$. Aunſwer: diuide $\frac{4}{7}$ by $13\frac{1}{7}$. and you ſhall finde $\frac{28}{100}$, whiche beyng abbꝛeuiated are $\frac{8}{30}$. And thus $\frac{4}{7}$ are the $\frac{8}{30}$ of $13\frac{1}{7}$.

6. Woꝛke. $12\frac{2}{3}$. what parte are thei of. Aunſwere: diuide. $12\frac{1}{3}$ by $\frac{25}{1}$, and you ſhall finde. $\frac{25}{60}$, whiche beyng abbꝛeuiated are $\frac{5}{12}$, and thus. $12\frac{1}{3}$, are the $\frac{5}{12}$ of 30.

7. Woꝛke. $16\frac{2}{3}$, what parte are thei of. $57\frac{1}{7}$. Aunſwere; diuide. $16\frac{2}{3}$ by. $57\frac{1}{7}$. and therof commeth $\frac{110}{1200}$, whiche beyng abbꝛeuiated are $\frac{7}{24}$, and thus. $16\frac{2}{3}$. are the. $\frac{7}{24}$ of. $57\frac{1}{7}$.

8. Woꝛke, $\frac{3}{4}$ and $\frac{2}{3}$ of $\frac{1}{4}$, oꝛ thꝛee qꝛaꝛters, and $\frac{2}{7}$ of one quarter, what parte are thei of. 1. Aunſwere reduce $\frac{3}{4}$, and the $\frac{2}{3}$ of $\frac{1}{4}$, into one bꝛoken by the firſt reduction, and you ſhall finde $\frac{11}{12}$. And thus the $\frac{3}{4}$, and $\frac{2}{3}$ of $\frac{1}{4}$ are the $\frac{11}{12}$ of one whole.

9. Woꝛke, of what nomber are. 9. the $\frac{3}{5}$. Aunſwere; diuide. 9. by $\frac{3}{5}$, and therof commeth

commeth. 13. $\frac{1}{2}$. whiche is the nomber whereof. 9. are the $\frac{2}{3}$.

10. More, of what nomber are $\frac{1}{5}$ the $\frac{3}{4}$. Aunswere: diuide $\frac{2}{3}$ by $\frac{3}{4}$, and thereof commeth $\frac{8}{15}$, whiche is the nõber wher of $\frac{2}{3}$ are the $\frac{3}{4}$ of the same nomber.

11. More, of what nomber are 5. $\frac{3}{4}$. the $\frac{3}{7}$. Aunswere: diuide. 15. $\frac{3}{4}$ by $\frac{3}{7}$, and you shall finde. 13. $\frac{5}{12}$, whiche is the nõber whereof. 5. $\frac{3}{4}$ are the $\frac{3}{7}$.

12. More. 9. $\frac{2}{3}$ what parte are thei of. 33. Aunswere: diuide. 9. $\frac{2}{3}$ by 33. $\frac{1}{2}$. And thereof commeth $\frac{58}{201}$: and thus 9. $\frac{2}{3}$ are the $\frac{58}{201}$ of 33. $\frac{1}{2}$ as appereth.

¶ The thirde parte treateth of certaine briefe rules, called rules of practise, with diuerse necessarie questions, profitable for Marchauntes.

¶ The first Chapiter.

Some there be, which doe call these rules of practise briefe rules, for that by thē many questions maie be doen with quicker expeditiō, then by the rule of thre. There bee others, whiche call them the small multiplication, for because that the producte, is alwaies lesse in quantitie, then the nomber whiche is to be multiplied. This practise commeth not in vse, but onely emong small kindes of nombers, whiche haue ouer theim, other nombers that are greater. And this beyng well considered, is no other thyng, but to conuerte lesser and perticuler kindes of nōber, into greater, the whiche maie bee dooen by the meanes

meanes of diuision, in taking the half, the third, the fourth, the fift, or suche other partes of the somme, whiche is to bee multiplied, as the multiplier is part of his greater kinde, & that which commeth thereof is worthe as muche (not in quantitie, but in his owne forme) as if you did multiplie simplie the twoo sommes, the one by thother, and for the better vnderstandyng of suche conuersions, you must haue respecte to one of these twoo consideracions. The first is, when one would demaunde this question. At 6. pence the yarde of Cotton, what are. 18. yardes worth by the price? It is manifest that thei are worthe. 18. peeces of. 6. pence the pece, or. 18. halfe shillynges, which must be tourned into shillynges, in takyng the halfe of. 18. shillynges, and thei make. 9. shillinges. Or otherwise you muste consider, that at. 1 shillyng the yarde, the. 18. yardes are worth. 18. shillynges, wherefore at. 6. pence thei shalbe but halfe so muche, for. 6. pence

is

is but the $\frac{1}{3}$ of.1. shilyng. Therefore you must take $\frac{1}{3}$ of.18.and thei make 9 shillinges, whiche are worth as much as.108. pence, that is to saie, as.18.times.6.pence.

2. Item, if you will multiplie any nomber, after this maner by pence, whereof the nomber of thesame pence doe not extende vnto.12.and therof to bryng shillinges into the product: you must knowe the certaine partes of. 12 whiche are these: that is to saie, 6, 4. 3. 2. and. 1. For.6. is the $\frac{1}{2}$ of. 12. and. 4. is the $\frac{1}{3}$. of. 12: 3. is the $\frac{1}{4}$: 2 is the $\frac{1}{6}$: and 1. is the. $\frac{1}{12}$. Then for. 6. pence, whiche is the halfe of. 1. shilyng, you must take the $\frac{1}{2}$ of all the nomber, whiche is to be multiplied. And that which commeth thereof, shalbe shillynges, if there do remaine. 1. it is. 6. pence.

For fower pence you must take the $\frac{1}{3}$ of all the nomber, that is to bee multiplied: and if any vnitis doe remaine thei shalbe thirdes of a shilyng, euery one beyng in value. 4. pence.

For

For. 3. pence you muste take the $\frac{1}{4}$. of all the somme: if any vnities doe remaine, thei shall bee fowerthes of a shilyng, euery one beyng worthe three pence.

For 2 pēce you must take the $\frac{1}{6}$ of all the the somme, and if any vnities doe remaine, thei shall bee fyre partes of a shilyng, beyng euery one of theim worthe twoo pence.

For. 1. penie, take the $\frac{1}{12}$ of the whole somme, if any vnities remaine, thei are. 12. partes of a shilyng, eche of them beyng in value. 1. penie, as by these examples folowing doeth plainly appeare.

£.

As 6. pence the yarde.
what 59. yardes.

29. shill. 6. pence.

£.

As 4. pence.
what 162.

27. shill. 4. pence.

£.

As

At	3. Pence.	
what	97.	
	24. shil. 3. pence.	
At	2. pence.	
what	346.	
	57. shil. 8. pence.	
At	1. pence.	
what	343.	
	28. shil. 7. pence.	

Here you maie se in the first exãple, that. 59. yardes, at. 6. pence the yarde is worthe. 29. shillynges. 6. in takyng the $\frac{1}{2}$ of. 59. And in the seconde exãple, the. 82. yardes at. 4. pẽce the yarde is worthe. 27. shillynges. 4. pence, in takyng the $\frac{1}{3}$ of. 82.

Likewise, in the third exãple. 97 yardes, at three pence the yarde, bringeth. 24. shillynges. 3. pence, in takyng the $\frac{1}{4}$ of. 97. Also in the fowerth exãple. 346. yardes, at. 2. pence the yarde, maketh. 57. shillynges eighte pẽce, in taking the $\frac{1}{2}$ of. 346. And finally

in the fyrst example. 343. yardes, at 1. d. the yarde, amount to 28. shill. 7. d. in taking the $\frac{1}{12}$ of 343. And so is to be done of all suche lyke, when the nomber of the pence, is any of the certaine partes of 12.

But if the nomber of the pence be not a certaine parte of 12. you muste reduce them into some certaine partes of 12. and after the foresayd maner you shall make two or three productes as neede shall require, and adde them togither into one summe as 5. d. may be reduced into 4. & 1. or els into 3. & 2. wherfore if you wil worke by 4. & by 1: you muste for 4. d. take fyrst the $\frac{1}{12}$. of ỹ nomber, that is to bee multiplied, and for 1. d. take the $\frac{1}{12}$, or rather for 1. d. you may take the $\frac{1}{4}$ of the product whiche did come of the 4. d. because that 1. d. is the $\frac{1}{4}$ of 4. d. But if you wyll worke by. 3. and you shal take for 3. d. the $\frac{1}{4}$ of the nomber whiche is to bee multiplied: and likewise for 2. d. the $\frac{1}{2}$ of the same nomber, adding togyther both

the products. The totall summe of those two nombers shall be the solution to the question. And in like maner is to be done of all other. As by these formes folowyng may appeare.

j.

At 5.d. the yarde.
What 49. yardes?

16. shil.	4.d.
4. shil.	1.
20. shil.	5.d.

ij.

At 7.d.
What 54?

18. shil.	•
13. shil.	6
31. shil.	6.

iij.

At 8.d.
What 40?

13. shill.	4
13. shil.	4
26. shil. 8.	8. d.

iiij.

lbj.

At 9. d.
What 73?

36. ſhil.	6
18. ſhil.	3
54. ſhil.	9. d.

lb.

At 10. d.
What 32?

16. ſhil.	0.
10. ſhil.	8.
26. ſhil.	8. d.

lbj.

At 11. d.
What 27?

9. ſhil.	0
9. ſhil.	0
6. ſhil.	9
24. ſhil.	9. d.

Here in this ſame firſte example where it is demaunded (at 5. pence ꝯ yard) howe much are nine and fourty yardes worth? Firſte for four pence,

I take ẏ ⅓ of 49.s. and thereof cõmeth 16.s.4.d. thẽ for 1.d. I take the ¼ of the same product, that is to say, of 16.s.4. d. and that bringeth. 4. shill. 1.d. these. twoo sũmes added togither, do make 20.s.5.d. And so much are the 49. yardes worth at 5.d. the yarde.

For 7. d. take the ⅓ and the ¼ of the whole summe which is to be multiplied, and adde them togither, that is to say, for 4. d. the ⅓ and for 3.d. the ¼: bycause 4.d. is the ⅓ of 12. d. and 3.d. is the ¼ as in the second example before doth appeare: Where the question is thus, at 7. d. the yarde what are 54. yardes worth: First for 4.d. I take ẏ ⅓ of 54: and they make 18. s. Likewise for 3.d. I take the ¼ of 54. and they are 13.s.6.d. Then I adde 18.s. and 13.s.6 d. togither, so both amount to 31.s.6.d and so muche are the 54 yardes worth at 7.d. the yarde.

Otherwise for 7. d. take first the ⅓, of the whole sũme for 6. d. Then for 1.d. take the ½ of the same product, and

adde

ādde them togither, so shall you haue the like summe as before.

For eight pence you must first take ⅓ of the whole sūme for 4. pence, and another ⅓ for other 4. d. and adde thē togither as in the.3.example doth euidently appeare. Where the question is thus, at 8.d. the yarde, what are 40 yardes worth? First for 4. d. I take the ⅓ of 40. which is 13.s. 4.d. Againe, I take another ⅓ for the other 4 pence which is also 13. shillings & 4. pence. These twoo summes being added togither, do make 26. shillings 8. pence, and so muche are the 40. yards worth at 8. pence the yard, as in the third example aboue layd doth appeare.

Otherwayes, for eyght pence you may take first the ⅓ of the whole sūme for 6.d. Then for 2.d. you shal take the ⅓ of the product, which did come of the said ⅓, and adde them togither, so shall you haue likewise the solution to the question. As in the same third exāple of 40. yardes, I take first the ⅓ of 40.

for 6.d. and thereof commeth 20. shil. then for 2. d. I take $\frac{1}{3}$ of the saide product, that is to say of 20.s. which bringeth 6.s.8.d. these two summes (20.s and 6.s.8.d.) I adde togither and they make 26.s.8.d. as before.

For 9.d. you must take the $\frac{1}{2}$ & the $\frac{1}{4}$ of the whole summe, and adde them togither: or els for 6. d. take first $\frac{1}{2}$ of the whole summe, then for 3. d. take $\frac{1}{2}$ of the same product, because 3.d. is $\frac{1}{2}$ halfe of 6.d: And 6. d. added with 3. d. bringeth 9. d. as by the fourth example, where it is demaunded after this sort: at 9.d. the yarde, what are 73. yardes worthe. First for 6. d. I take the $\frac{1}{2}$ of 73. and thereof commeth 36. s. 6.d. then for 3.d. I take $\frac{1}{3}$ of $\frac{1}{2}$ same 36. shil. 6.d. which is 18.s.3. d. these twoo summes bee I adde togither, & they make 54. shil. 9. d. as in $\frac{1}{2}$ said fourth example is evident.

For 10.d. take first the $\frac{1}{2}$, then $\frac{1}{2}$ $\frac{1}{3}$ of the whole summe, & adde thē togither

For 11. d. take first $\frac{1}{3}$ for 4. pence, se-

condly

condely, another $\frac{1}{3}$ for other 4.d. and thirdly $\frac{1}{4}$ for 3.d. of all the whole summe. and adde them togither.

Worcis for 11. d take first the $\frac{1}{2}$ then then $\frac{1}{3}$ of the whole summe, and finalye the $\frac{1}{4}$ of the laste produce, addinge them togither.

3. Lykewise by the same reason, when you will multiply (by shillings) anye nomber that is vnder 11. s. you shall haue in the product poundes, if you knowe the certaine partes of 20: which are these: 10.5.4.2.1. For 10. is the $\frac{1}{2}$ of 20. 5. is the $\frac{1}{4}$ part: 4 is the $\frac{1}{5}$. 2. is the $\frac{1}{10}$: and 1. is the $\frac{1}{20}$.

Then for 10. s. which is the $\frac{1}{2}$ of a pounde: you muste take the $\frac{1}{2}$ of the nomber, whiche is to bee multiplied, and you shal haue poundes in the product. If there be no remaine 1, it shalbe worth ten shillings.

For 5. shillinges you muste take the $\frac{1}{4}$ of the nomber whiche is to bee multiplied, & if there be remaine anye vnities, they shall be foure partes of

a pound, every one being in value 5. s.

For 4. s. you must take the $\frac{1}{5}$ of the number whiche is to bee multiplyed. And if there do remaine any vnities, they shall be fift parts of a pound, every one being worth foure shillings.

At 10. shillings the Peece.
What 75. Peeces?

37. li. 10. shil.

At 5. shil.
What 89.

22. li. 5. shil.

At 4. shil.
What 93.

18. li. 12. shil.

For 2. shillings you must take the $\frac{1}{10}$ of the nōber that is to be multiplied. Wherefore, if you wyll take the $\frac{1}{10}$ of any nomber, you muste separate the last figure of the same number whiche is nerest your righte hande, from all the

the other fygures. For all the other figures whiche doe remaine towards your lefte hande, from the same fygure, which is separated, shall bee the sayde $\frac{1}{10}$ of a pounde: and that separated fygure, towarde your right hand shall be so many peeces of 2. shillings the peece: the whiche fygure must be doubled, to make therof shillings, as by these examples appeareth.

At 2. shil.

What 9|8.

9. li. 16.

At 2. shil.

What 40|3.

40. li. 6. shil.

Herebyō doth depend an other exact way for to multiply by shillings (if ỹ nomber of shillings be euen) which is thus: you shall take $\frac{1}{2}$ the nōber of the same shillings, and conuert them into peeces of 2. shillings. Then by the nomber

nomber of this halfe, you muſt firſte multiply the laſt figure towarde your right hande, of the nōber which is to be multiplied: And if ther be any tennes in the ſame product, thoſe muſt you reſerue in your minde: But if (wyth the ſame of els without the ſame) you doe finde any diget nomber, the ſame diget nomber ſhall you double, & put it in the place of ſhillings: Then muſt you proceede to the multiplication of the other figures, adding vnto ẏ product the tennes whiche you before reſerued: and therof ſhall come pounds.

Nowe, for your better vnderſtanding of this which hath bene ſaid and by the way of example, I will propone vnto you this queſtion.

At 8. ſhillings the groſſe, what are 47. groſſe worth after the rate?

Firſte in this example I take halfe the nomber of 8 ſhillinges, as before is taught, that is to ſay of eighte ſhillings, which is foure ſhillinges: this 4. ſhil. I put apart, behinde a croked line,

line right against 97. towardes the left hand, as here you may see and as here after dooeth appeare by diuers examples.

At 8. shil. the Grosse.

4) *What* 9 | 7

38. li. 16. shil.

At 6. shil.

3) *What* 9 | 9

29. li. 14. shil.

At 12. shil.

9) *What* 34 | 5

207. li. 0. shil.

At 14. shil.

7) *What* 21 | 0

147. li. 0. shil.

Nowe in the first example, where it is demaunded, at 8. s. the grosse, what are 97 grosse? First the ½ of 8. s. whiche is 4. s. being set apart behind the crooked line, as before is said: the I multiplye ỳ 97 by 4. saying first, 4. times 7. is 28. I double ỳ viget nũber 8. and that

that maketh 16, the which 16, I do put vnder the line, in the place of shillings & I kepe ẏ tennes in my mind, which here are 2. For 20. are two times ten: Then secondly, I multiply 9. by the sayd 4, and thereof cõmeth 36: wherunto I adde the 2. tennes, whiche before I reserued, and they make 38. Therfore I put 38, vnder the lyne in the place of poundes, and the whole summe will be 38.li.16.s. Thus much are the 97. grosse worth, at eight shillings the grosse: the like is to be done of all other. As of 12. shillings in multiplyng by 6. Likewise of 6. shillings if you multiply by 3. also of 14. if you multiply by 7. And so of all euen nombers after the same maner.

For 1. Shilling you must take the $\frac{1}{2}$ of the $\frac{1}{10}$ parte of any nomber that is to be multiplied. And if any thyng do remaine, they are shil. Thus by thys maner shil.

At 1. shil.
VVhat 35|0
17, li. 10. shil.

are

are conuerted into poundes: for it is euen like, as if you did diuide the by 20.s. as by this exãple in the margent doth appeare. Where it is demaunded at 1.s. the yard, the peece, or any other thing, what are 350. worth?

First I separate the laste fygure of 359. perte to my ryght hand, which is the 0 with a line betwene it and the figure 5. Then I make a line vnder the 3 |0, and I take the $\frac{1}{2}$ of 35, after this maner: saiyng the $\frac{1}{2}$ of 3. is 1. and 1 remaineth, whiche remaine signifieth 10. in that secõd place. Then I put 1. vnder the line against 3, & I proceede to the rest, saiyng: the halfe of 15. is 7. (which 15. came of the 1. that remayned, and of the 5. in ỹ first place) I put 7. vnder the line right against 5, and they make 17 li. The 1. which did last remaine, is 10.s. Therfore I put 10.s aparte vnder the line, and the whole summe is 17.li. 10.s. so much are 350. worth at 1.s. the peece.

But when the nomber of shillings is

is not some certaine parte of 20. shil. you must then conuert the same nomber of shillings, into the certain parts of 20. and make two or three products, as nede shall require, the whiche must bee added togither after this maner following.

For 3. shillings you must firste take for 2. shil. the $\frac{1}{10}$ of the nomber that is to be multiplied, the for 1. shilling you must take the $\frac{1}{2}$ of the produce whiche did come of the same $\frac{1}{10}$ part: and adde those twoo sūmes togither, as appeareth by this example following.

At 3. s. the peece of any thing, what shall 684 peeces coste mee after the rate. First, for 2 shillings I take the $\frac{1}{10}$ of 684, which is 68: in separating the last figure 4, whiche 4 I must double, & they be 8. I set eight shillings aparte from the place of poundes, and then I haue 68. poundes 8. s. for the $\frac{1}{10}$ parte, that is to say,

At 3. shil.	
What 684?	
	68. li. 0. sh.
	34. 4.
	102. li. 12. sh.

for

for the 2.s. secondlye, for 1. shil. I take the $\frac{1}{2}$ of the product, that is to saye: of 68. li. 8.s. whiche is 34. li. 4. s. and I put the same vnder the 68. li. 8. shil. Then finally, I adde those two summes together, that is to saie, 68. li. 8. s. and 34. li. 4. shil. so they make 102. li. 12. s. and so much are the 684. peeces worth at 3. shillings the peece, as may appere in the margent.

For 6. shil. take $\frac{1}{10}$ of the nomber whiche is to be multiplied: that is to say, first $\frac{1}{10}$, then double the product of the same $\frac{1}{10}$ and adde them togither. Or otherwise for 4.s. take first $\frac{1}{5}$ of the nomber that is to be multiplied, then take the $\frac{1}{3}$ of the product which is for two.s. and adde them togither.

Or els take for 5. shil. the $\frac{1}{4}$ of the whole summe, then for 1. shil. the $\frac{1}{5}$ of the product and adde them togither.

Likewise for 7. shil. take firste for 5. shil. the $\frac{1}{4}$ then for 2. shillings take the $\frac{1}{10}$ of the nomber whiche is to be multiplied, and adde them togither.

For

For eyght shillings take the ½ at two sondry times, that is to say, first ¼ for 4. shil. and then as muche more for o ther 4. shil. and adde them togyther.

For 9. shil. take first the ½ and lykewise the ¼ of the number that is to be multiplied, and adde them togither.

For 11. shil. take first ½ for 10. s. The for 1. shil. take the 1/10 of the products, & adde them togither.

For 12. shil. take first the ½ for 10. shil then for 2. s. take the ⅙ part of the product, and adde them togither,

For 13. shil. take the ¼ then the ⅓, and againe another ⅐ of the nomber which is to be multiplied. And adde the products togither, that is to saye: fyrste for 5. shil. take the ¼, then for 4. shil. take the ⅓. And againe, another ⅐ for the other 4 shil. and assemble the three products, the like is to be done of all others, when the price of the thynge which is valued, is onely of shillings. And as by these examples following doth plainly appeare.

At	6.shil.	
what	67.	
	13.	.8.
	6.	.14.
	20.li.	2.shil.
At	7.shil.	
what	347.	
	86.	15.
	34.	14.
	121.li.	9.shil.
At	8.shill.	
what	540.	
	108.	0.
	108.	0.
	216.li.	0.shil.
At	9.shill.	
what	230.	
	57.	10.
	46.	00.
	130.li.	10.shil.
At	11.shil	
what	159.	
	79.	10.
	7.	19.
	87.li.	9.shil
At	12.shil.	
what	349.	

	174.	.10
	34.	.18.
	209.li.8.ſhil.	
As	13.ſhil.	
what	267.	
	66.	.15
	53.	.8.
	53.	.8.
	173.li.11.ſhill.	

4. Likewiſe in multiplyng by pẽce you ſhall haue (at the firſte inſtaunte) poundes in the product, in caſe you knowe the certaine partes of the $\frac{1}{10}$ of a pounde, or of. 24. pence, whiche are theſe, 12. pence. 6. 4. 3. and. 2. For. 12. is the $\frac{1}{2}$ of. 24: 8. is the $\frac{1}{3}$: 6. is the $\frac{1}{4}$. 4. is the $\frac{1}{6}$: 3. is the $\frac{1}{8}$: 2. the $\frac{1}{12}$: but for. 12. pence, whiche is. 1. ſhillyng: wee haue before made mention thereof.

For 8 pence you muſte take the $\frac{1}{3}$ of the $\frac{1}{10}$, and the reſte whiche are the peces of 8 pence, muſte bee doubled to make of them peeces of. 4. pence. And of the ſame nomber beyng doubled, you muſte take the $\frac{1}{5}$, whiche will bee

ſhillynges,

shillynges, and if there doe yet remain any thing, thei are thirds of a shilling being in value 4 pence the pece.

For 6 pence take the $\frac{1}{4}$ of the $\frac{1}{10}$, and of that whiche remaineth, you muste take the $\frac{1}{3}$, whiche shall be shillynges, if there doe yet remaine. 1. it shall bee in value. 6. pence.

For 4 pence you must take the $\frac{1}{6}$ of the $\frac{1}{10}$, and of that whiche resteth, take the $\frac{1}{3}$ to make therof shillynges, if any thyng dooe yet remaine, thei are thirdes of a shillyng, beyng in value. 4. pence the pece.

For 3 pence take the $\frac{1}{8}$ of the $\frac{1}{10}$, and of that whiche remaineth, take the $\frac{1}{4}$, to make of theim shillynges: if any thyng doe yet remaine, thei are fourthes of a shillyng, euery one of theim beyng worthe 3. pences.

For 2 pence take the $\frac{1}{12}$ of the $\frac{1}{10}$: and of that whiche resteth take the $\frac{1}{6}$, the whiche are shi. if there do still remain any thing, thei shalbe sixte partes of a shilling, euery one being in value 2 d.

For 1, penie it is impossible with ease, to bring of pence, poundes (into the produce) upon the totall somme: But strike you must bring them into shillinges by the order of the seconde rule of this chapiter, and then afterwarde you shall converte them into pounds, if nede so require. As by these examples followyng may appere.

At	8.d.
what	59|6.
	29.li.17.shil.4.d.
At	4.d.
what	93|4.
	16.li.19.shil.
At	4.d.
what	93|4.d.
	15.li.11.shil.4.d.
At	3.d.
what	57|1.
	7.li.2.shil.9.d.
At	2.d.
what	36|4.
	3.li.0.shil.8.d.

At

At	1.	d.
what	66	5.
	5	5. 00. shil. 4. d.

2. li. 16. shillings. 4. d.

But if the number of pence, be not a certaine parte of 24. pence. Then must you bring them into the certain partes of 24. and make thereof diuers products, which must be added together, as shall hereafter appeare.

For. 5. pence you shall first take for 3. pence, then for. 2. pence, and adde the together, according to the instruction of the laste rule. Or els firste take for 4. pence, and then for. 1. penie.

For. 7. pence, first take for. 4. pence then for. 3. d, and adde them together.

For 9 pence, firste take for 6 pence, then for 3 pence adoyng the together.

For. 10. pence, firste take for 6. d. then for. 4. d, and adde them together.

For. 11. pence take firste for. 8. pence then for. 3. pence, and adde them together: as by these examples followyng both appeare.

As 5.d.
what 92|7.

	11.	.11.	.9.
	7.	.14.	.6.
	19.li.	6.ſhil.	3.d.

As 7.d.
what 51|2.

	8.	10.	.8.
	6.	8.	.0.
	14.li.	18.ſhil.	8.d.

As 9.d.
what 54|6.

	13.	13.	.0.
	6.	16.	.6.
	20.li.	9.ſhil.	6.d.

As 10.d.
what 27|3.

	6.	16.	.6.
	4.	11.	.0.
	11.li.	12.ſhil.	6.d.

As 11.d.
what 26|4.

	8.	16.	.8.
	3.	6.	.0.
	12.li.	2.ſhil.	0.d.

5. If you will multiplie any nũbers by ſhillynges and pence, beyng bothe

together, you muſt take firſt for the .s. accordyng to the information of the third rule of this chapiter, then take for the pens, after the order of the fourth rule before mentioned: but if there be any certaine partes of .l. pounde, containyng bothe ſhillynges and pence, then for ſuche partes you ſhal take the like parte of the nomber that is to bee multiplied, as the nomber is part of .l. li. the whiche certain partes are theſe, 6.s.8.d: 3.s.4.d: 2.s.6.d: and .1.s.8.d. For 6.s.8.d. is the $\frac{1}{3}$ of a li. 3.s.4.d. is the $\frac{1}{5}$ of a li. 2.s.6.d. is the $\frac{1}{8}$: and 1.s.8.d. is the $\frac{1}{12}$: then for 6.s.8.d. you muſte take the $\frac{1}{3}$ of the nomber that is to bee multiplied: and if any thyng doe remain, thei are thirdes of a pounde, every one being worthe 6.s.8.pence: For 3.s.4.d. you muſt take $\frac{1}{2}$ if any thyng doe remain, thei are 6 partes of a li. euery one beyng in value 3.s.4.d. For 2.s.6.pẽce, you muſt take the $\frac{1}{8}$: if any thyng be remaynyng, thei are 8 partes of a li. euery one being worth 2.s.6.d.

For. 1. shilyng. 8. pence, you shall take the $\frac{1}{13}$, if there doe any thyng remaine, ther are twelfth partes of a. li. euery one beyng valued at. 1. s. 8. d.

At	6. shil. 8. d.
what	647.
	215. li. 13. shil. 4. d.
At	3. shil. 4. d.
what	220.
	36. li. 13. shill. 4. d.
At	2. shil. 6. d.
what	47.
	5. li. 17. shill. 6. d.
At	1. shil. 8. d.
what	400.
	33. li. 6. shil. 8. pence.

6. Here shall you accustome your self, to multiplie by all sortes of sommes, beyng compounde of shilyngs, and pence, whiche maie come to practise. As thus, for. 1. shilyng. 1. penie: for. 1. shilyng. 2. pence: for. 1. shilyng 3. pence: for. 1. shilyng 4. pence. Likewise for 2. shilynges 1. penie: 2. shilyng. 2. pence: 2. shilynges. 3. pence. 2. s. 4. d. And so of all other; considering moreouer,

ouer, many subtile abbreuiations, whiche happen oftentymes, that are easie to bee conceiued. As thus: at 11.s.3.d. after that I haue taken first the $\frac{1}{2}$ for 10. shillynges. Then for 1. shillyng. 3. pence. I take the $\frac{1}{3}$ of the product, because 1. shillyng. 3. pence is the $\frac{1}{3}$ of 10 shillynges, in takyng thesaied $\frac{1}{3}$ of the product. And by this meanes, when ye haue taken one product, ye maie oftentymes vpon the same, take an other more briefly, then vpon the some that is to be multiplied, whiche thyng you must forsee.

At	11. shill. 3. d.		
what	53.		
	26.	.10.	.0
	3.	.6.	.3
	29. li. 16. shil. 3. d.		
At	6. shil. 3. d.		
what	58.		
	14.	10.	.
	3.	12.	6.
	18. li.	2.	6. d.
At	12. shill. 8. d.		
what	64.		

32.	0.	0.
6.	8.	0.
2.	2.	8.
40.li.	10.shil.	8.d.

7. But if you will multiplie, by pounds, shillinges & pence being together. First you muste wholly multiplie by poundes. Then take for the shillynges & pẽce, as in the. 5. rule of this chapiter is plainly declared. And as by these examples folowyng maie appeare.

At	3.li.	6.shil.	4.d.
what	49.		
	47.	0.	0.
	16.	6.	8
	163.li.	6.shil.	8.d.
At	5.li.	18.shill.	4.d.
what	543.		
	2715.	0.	0.
	171.	10.	0.
	135.	15.	0.
	90.	10.	0
	3212.li.	15.shil.	0.d.
At	2.li.	7.shil.	4.d.
what	927.		
	1854.	0.	0.
	185.	8.	0.

2153.li. 18.shil. 0.d.

8. Do these rules do serue, both to buy & sel, at suche a price the ell, the yard, ẏ pece, the li. waight or any other thing: how much such a thing. Likewise thei are very necessary to conuert all peces of gold & siluer into li. for I may aswel sate, at. 4. s. 8. d. the Frenche croune, what are 135 crounes worth? As to say at. 4. s. 8. d. the yarde of clothe, what are 135. yardes worthe?

9. When any 1 of the sõmes (which is to be multiplied) is cõpounde of many denominations: & thother is of one figure alone: then shall ye multiplie al the denominations of thother somme, by the same one figure, beginning first with ẏ somme, which is least in value towards your right hand, & bryng the product of those pence into shi. and the product of the shillinges into poundes as by this example doeth appeare.

At	3. li. 9. shil. 8. d.
whvt.	7.
	24. li. 7. shil. 8. d.

10. But

10. But (if any of the nombers whiche are to be multiplied) there bee with it a broken nomber, you muste (accordyng to his denominator) take one or many partes of the nomber, as nede doeth require: and sette the nomber whiche commeth thereof, under the produckes, addyng the same together. As thus: At 5. pounde 7. shillynges 8. pence the grosse, what shall .34. grosse $\frac{1}{2}$ cost? First you shall multiplie 5. pound. 7. s. 8. pence by .34. grosse, sayyng. 5. tymes .34. doe make 170. pounde then for .6. shillyng. 8. pence, take the $\frac{1}{2}$ of .34. whiche is .17. pounde. 6. shillynges. 8. pence. Thirdly, for .1. shillyng, make .34. shillynges, whiche is 1 pounde 14. shillynges. 0.

At 5.li.7.sh.8.d.			
What .34 $\frac{1}{2}$.			
	170.	0.	
	11.	6.	8.
	1.	14.	0
	2.	13.	10.
185.	li. 14.	sh. 6.	d.

Lastly, for the $\frac{1}{2}$ grosse, you muste take $\frac{1}{2}$ of the .5. pounde 7. shillynges 8 pence,

pence, whiche is. 2. pounde. 13. s. 10. d. And then adde the all together, so you shall finde that the. 34. grosse $\frac{1}{2}$ at. 5. li. 7. shillynges. 8. pence is woxthe. 185. pounde. 14. shillynges. 6. pence, as appeareth in the margent.

And as in this last example, you did take the halfe of the money, (whiche one grosse was woxthe) for the $\frac{1}{2}$ grosse Because that one grosse beyng woxth 5. pounde. 7. shillynges. 8. pence, the $\frac{1}{2}$ grosse must be woxthe halfe so muche So likewise, if you haue $\frac{1}{3}$ of a grosse or of any other thyng, you muste take the. $\frac{1}{3}$. of the pxice, that one grosse is woxthe. Semblable, for the. $\frac{1}{4}$. of any thyng you shall take the $\frac{1}{4}$ of the pxice, that one is woxth, and of all other fractions, as by these examples following doth appeare.

At	4. li. 6 shil. 8. d.		
what	46. $\frac{1}{2}$		
	184.	.0.	.0
	15.	.6.	.8
	2.	3.	.4
			201.

	20 li.	10. shil.	0. d.
As	8. li.	0. shill.	9. d.
what	54. ½.		
	432.	0.	0
	1.	7.	0
	0.	13.	6.
	2.	13.	7
	43. li.	24. shil.	1. d.
As	3. li.	16. shil.	8. d.
what	17. ½		
	51.	0.	0
	8.	10.	0
	8.	13.	4
	1.	18.	4
		19.	2
	68 li.	00. shil.	10. d

11. If you will make the proofe of these rules aforesaid, you must first abate the summe of money (which the fractiō of the multiplicand doeth import) from the total summe. And diuide the rest of the pounds of the said totall sōme, by the whole multiplicande, the fraction onely accepted. And if any thing doe remain after the diuision is made, that remain shalbe multiplied by 20 & vn-

to

to the producte of that multiplication, you shal adde the shi. which remained of the rest of the totall sõme. Again, if any thing do remain after the same diuision, you must multiply the same by 12 & vnto ẏ product adde the pence of ẏ total sõme that remained if any be left And thus if ye haue truely wrought, you shall finde again the higher sõme of your questiõ, that is to saie, the price that one grosse, or any other thyng is worthe, whereof you demaunde.

Or otherwise, reduce the remaine of the totall somme (the value of the money that the fraction is worthe, beyng firste deducted) all into pence, in multiplyng the poundes by. 20. and the shillynges by. 12. addyng thereunto the shillynges and pence, which are ioigned with the remaine of the saied totall somme, if any suche be, then diuide those pence by the foresaied nomber that is to be multiplied, the fraction of the same nomber being also abated. So shall you finde the price that

one

one pece, I grosse, or any other thyng is valued at. As in the firste example goyng before, where the totall sõme is. 201. pounde. 10. shillynges, from the whiche I doe firste abate the price of the halfe grosse, whiche is. 2. pound 3. shillynges. 4. pence, the reste is 199. li. 6. shillynges 8. pence, whiche being reduced into pence, bringeth 47840. d. I diuide thesame by 46. and thereof commeth 1040. d. Then I diuide that 1040. d. by 12, and thei bryng 86. s. 8. d. that is to sate 4. li. 6. s. 8. pẽce, which is the price that one grosse, or any other thyng did coste, as in that firste example doeth appeare.

12. The like is to bee doen of any maner of thyng, that is solde by the hundred, or by Kintall. As thus: at 12. pounde seuen shillynges fiue pence the hundreth pounde waight: what shall. 374. pounde waight coste. You shall firste multiplie twelue pound seuen shillinges, fiue pence by three: that is to sate, by three hundreth. Then for

50. li.

50.li. waight, you shall take the $\frac{1}{5}$ of 12.li.7.s.6.d. bicause 50. li. is the $\frac{1}{5}$ of 100. li. Likewise for 20. pound waight, which is the $\frac{1}{7}$ of 100.l. take the $\frac{1}{7}$ of 12.li.7.shil.6.d. lastly for 4.li. waight take the $\frac{1}{7}$ of the laste product. This done, you muste adde all these products into one summe, whiche will make the summe of 64.li.5.s. 7.d. $\frac{4}{7}$, as by this exāple above written doth appeare.

At 12.li.7.sh.6.d.

What 374.

37. .2. .6
6. .3. .9
2. .9. .6
0. .9. .10. $\frac{4}{7}$

40.li.5.sh.7.d. $\frac{4}{7}$

The proofe is made by reducinge the totall summe into pence. And to divide the product by the number ℔ is to be multiplyed, that is to sate by 374 likewise divide the quotient produced of that first division by 12. so shall you finde againe the higher summe 12.li.7 shil.6. d. whiche is the price of 100. li. wayght, as before.

13. Also the like maye be vsed of

our vsuall waight here in Englande (whiche is 112. li. for euerye hundred pounde waight). in case you knowe the certaine parts of a hundred, that is to say, of 112. li. waight, whiche are these 56. li. 28. li. 14. li. 7. li. For 56. li. is the $\frac{1}{2}$ of 112. 28. li. is the $\frac{1}{4}$ of 112. li. 14. li. is the $\frac{1}{8}$, and 7. li. is the $\frac{1}{16}$.

Therefore, for 56. li. take the $\frac{1}{2}$ of the summe of money, that the 112. pound waight is worth.

For 28. li. take the $\frac{1}{4}$ of the summe of money that the 112. li. is worth.

For 14 li. take the $\frac{1}{8}$ of the summe that the C. is worth.

For 7. li. take the $\frac{1}{16}$ of the summe of money that the C, is worth.

As thus: at 3. li. 5. s. 8. d. the hundreth pounds waight, that is to saye, the 112, li. What shall 24. C. 3. quar. 21, li. cost after the rate?

First, you shall multiply 24, hundreth by 3. whiche is the 3. li. & thereof cõmeth 72. li. then for 6. s, 8, d. whiche is the $\frac{1}{3}$ of 20. s. you shall take $\frac{1}{3}$ of 24

which

which is 8, li. for 24. nobles maketh 8, li. afterwarde, for the 3. quarters of the C. you shall first for the 56. li. take fthe $\frac{1}{3}$ of 3. li. 6. s. 8, d. bicause 56. li is the $\frac{1}{3}$ of the C.

At	3. li.	sh. 8.	d.
VVhat	24.	3.	21. li.
	72.	0.	.0
	8.	0.	.0
	1.	13.	.4
	.	.16.	.8
	.	.8.	4
	.	.4.	.2
	83. li.	2. sh.	6. d.

& thereof cõmeth 1. li. 13. shil. 4. d. then for 28. li. (whiche is the quar. of a C.) you shall take the $\frac{1}{4}$ of 3. li. 6. s. 8. d. or els the $\frac{1}{2}$ of the product, whiche came of 56. li. which is 16, s. 8, d likewise for 14. li. take the $\frac{1}{3}$ of 3, li. 6, s. 8. d. whiche is 8, s. 4, d. or els the $\frac{1}{2}$ of the producte of 28. li. which is all one: lastly for 7. li. take the $\frac{1}{16}$ of 3, li. 6. s. 8, d. or els the $\frac{1}{2}$ of the product, that came of 14 li. and therof cõmeth 4, s. 2, d. Then adde al these products togither: & the totall summe wil be 83. li. 2. s. 6. d. so muche are ẏ 24. c. 3. quar. 21. l. waight worth after 3, li. 6. s. 8. d. ẏ C. as appereth in

the margent.

The proofe hereof is made, lyke as to the other proofes aforesaide, saving that where in those proofes, you abate the price of the money, that the fraction was worthe, from the totall summe: here in this example (and in suche other like) you muste abate the price of money, that the odde waight amounteth vnto (ouer and aboue the iuste hundrethes) from the saide totall summe, the rest thereof shall you conuert into pence, diuidinge the product of ỹ multiplication by the iuste nũber of the hundrethes, so shall you finde the pence ỹ one hundreth is worthe, whiche you shall bringe into pounde by the order of diuision, & so all other.

¶ The second Chapter treateth of thẽ rule of three compounde, which are foure in nomber.

There belongeth to the fyrst & seconde partes of the rule of thre compounde alwaies fyue numbers: whereof (in the first part

part of the rule of three compounde the seconde nomber and the fifte, are alwayes of one semblaunce, and like denomination: whose rule is thus, multiply ẏ first nōber by the seconde, & that shalbe your diuisor: then multiplie the other three nōbers the one by the other to be your diuidende. Exāple, of this first part: if 100. crowns in 12. monthes, do gaue 15. li. what will 60. crownes gaine in 8. monthes? Answere, first multiplie 100. crownes by 12. monthes, & therof cōmeth 1200. for your diuisor: then multiply 15. li. by 60. crownes, & by 8. monthes, & you shal haue 7200. diuide 7200. by 1200, & therof cōmeth 6. li. so many li. wyl 6. crownes gaine in 8. mōthes: this questiō may be done by ẏ double rule of 3. ẏ is to say by ẏ rule of 3. at 2. times, but yet this rule of 3 cōpoūd is more brief.

Crownes.	monthes.	poundes.	crownes.	monthes.
100.	.12.	.15.	.60.	.8.

X

7.2 | 00

X.2 | 00 (6.li. 2 In

2. In the seconde part of the rule of third compound, the 3. nomber is like vnto the fift, wherof the rule is thus: multiplie the 3. nomber by the 4. the product shalbe your diuisor: then multiply the first nomber by ẏ seconde, & the product therof by the fift, ẏ whiche nomber shalbe your diuidend, or nõber ẏ is to be diuided: as by example.

When 60. crownes in 8 monthes do gaine 6. li. in howe many monthes will 100. crownes gain. 15. li. Aunswer Multiply the thirde nomber 6. by the fourth nõber 100, & therof cõmeth 600 then multiplye the first nõber 60. by the secõd nõber 8. & by the fift nõber 15 thereof will come 7200. then diuide 7200. by 600. & ẏ quotiẽt wilbe 12: in so many monthes will 100. crownes gaine 15. li. This question may likewise be done by the double rule of 3.

Crownes, monthes, pounds, crownes, poundes.
60. .8. .6. .100. .15.

~~1~~	
~~7~~ 2	0 0 monthes.
~~6~~ ~~8~~	0.0 (12

3. In

3. In the thirde part of the rule of 3. compounde, there may be 5. nombers or more: & in this rule the firſt nõber & the laſt are alwayes diſſemblaunt the one to thother: & the queſtiõ is from the laſt nõber vnto the firſt, wherof ỹ rule is thus: multiply that nomber which you woulde know by thoſe nõbers which do giue the value, & diuide the produit of the ſame, by ỹ multiplication of the nõbers which are alreadye valued, as by exãple. ℔ 4. deniers pariſis, be worth 5. deniers tournois, & 10. deniers tournois, be worth 12. deniers of Sauoy, I demaũd how many deniers pariſis are 8. deniers of Sauoy worth? Anſwere. Multiply 8. deniers of Sauoy (which is the nõber ỹ you woulde know) by 4. deniers pariſis, & by 10 deniers tournois which are ỹ nõbers that giue ỹ value, & they make 320: then multiplie 5. deniers tournois, by 12 deniers of Sauoy (which are the nombers alredye valued) and they make 60 laſtly diuide 320. by 60

and you shall finde 5. deniers ½ parisis, so muche are the deniers of Sauoye worth.

Parisis.	*tournois.*	*tournois Sauoye.*	*Sauoye.*
4. d.	*.5 d.*	*.10 d.*	*.12 d.*	*. 8 d.*
℔ 2	0	par.		
℔	0	5. d. ½		

4. In the fourthe parte of the rule of thres compounde: the firste nomber and the laste are alwaye semblant and of one denomination, and the questiõ of this rule, is alwayes from the laste nõber to the laste saving one. Wherof there is a rule which is thus. You must multiplye that nomber which you woulde knowe, by the nombers that are alreadye valued, and diuide the product of the same, by the multiplication which commeth of the nombers that giue the value, as by exãple

If 4: deniers Parisis, bee worth 5. Deniers Tournois, and 10. Deniers Tournois, be worthe 12. Deniers of Sauoy, I demaunde how many Deniers

niers of Sauye. are 15. Deniers Parisis worth. Aunswere: Multiplye 15. Deniers Parisis that you woulde knowe, by 5. Deniers Tournois, & by 12. Deniers of Sauoye, which are the nombers alreadye valued, and they make 900. Diuide the same by 4 times 10. which are the nombers that doe giue the value, and you shal finde 22. Deniers ½ of Sauoye, so much are the 15. Deniers Parisis worth.

Parisis.	*tournois.*	*tournois.*	*Sauoy.*	*Parisis.*
4.d.	.5 d.	.10 d	.12 d.	.15 d.

~~1~~2 |
~~9~~~~0~~ | 0 Sauoy.
~~4~~~~4~~ | 0 (22.d. ½

The thirde Chapter treateth of *questions of the trade of Marchaundise.*

If 31. Deuonsh. dosēs do cost me 100. li. 15. shil. What shal 4. dosens cost? Aunswere: first bring the 100. li. 15. shill. all into shillings,

in

in multiplying ẏ 100. li. by 20. adding to the product the 15. shill. and thereof commeth 2015. shill. then multiplye 2015. by the thirde number 4. and divide the product by 31. and the quotient wilbe 260. s. The which divide a-againe by 20. & therof commeth 13. li.

Dosens.			Dosens.
31.	100. li.	15. sh.	4. d.

10
2015
4
8060.

1
28
8006 (260.
8 1 1 1
3 3

If foure Dosens be worth 13. pound What are 31. Dosens worthe by the price? Annswere: Multiply 31. by 13. & therof cōmeth 403. The whiche you shall divide by 4. and thereof commeth

meth 100.li. ¾, which ¾ are 15.s. and so much are 31. Dosens worth as before.

Dosens.	li.	Dosens.
4.	13.	31.
		13
		393
		1
		403.

403
AAA (100.li. ¾

If 49 elles be worth 2.li. 4.s.11.d. what are 18 elles worthe by the price? First you must bring 2.li.4.s.11.d. all into pence, in multiplying 2.li. by 20. maketh 40. adde thereto 4. shil. they make 44.s. which multiply by 12.d. & they make 528.d. wherunto adde 31.d all is 539.d. the whiche 539.d. make be your second number in the rule of 3. then multiply 539 by 18. & thereof commeth 9702. divide the same by 49. & you shall have in your quotient 198.d. which divide by 12. & you shall finde 16.s.6.d. so much are the 18. elles worth.

Elles

Elles:			Elles.
49.	.2. li. | 4. sh. | 11. d.		.18,
44	20		539
	44	01	162
	12		54
	99		90
	44		
	539		9702

13	1
427	76
586	198 (16. sh. 6. d.
9702 (198.	122
4399	1
44	

If 18. elles be worth 16 s. 6. d. what are 49. elles worth by the price? Auns. bring 19. s. 6. d. into pence, in multiplying 19. by 12. and thereof commeth 198. d. with the 6. d. adde dto it, then multiplye 198 by 49. the product will be 2702. The which diuide by 18. elles and therof commeth 539. d. Then diuide 539. d. by 12. and the product therof by 20. So shall you haue 2. li. 4. sh. 11. d.

11.d. so muche are the 49. elles worth.

Elles.		*Elles.*
18.	.16. sh. 6. d.	.49
	12	198
	32	392
	166	441
	198	49
		9702

~~17~~	1
~~446~~	~~181~~
~~9702~~ (539	~~539~~ (44. *shill.*
~~1888~~	~~122~~
~~12~~	~~1~~

If a yarde of Veluet cost 19. s. what shalt $\frac{3}{4}$ of a yarde cost? Aunswere: sette down your nombers thue. If $\frac{1}{1}$ | $\frac{19}{1}$ | $\frac{3}{4}$, Then multiplye 1. times 16. by 3. and thereof cōmeth 57, for your diuidēde, or nomber to be diuided. The whiche 57. you shall diuide by 1, times 1, foure times, which are 4, and your quotient will be 14 s. $\frac{1}{4}$, which $\frac{1}{4}$ is worth 3. d. so much

muche are the $\frac{1}{4}$ of a yarde worth after 19. shil. the yarde, as by practise followeth.

$\frac{1}{1}$ | $\frac{19}{1}$ | $\frac{3}{4}$ |

~~1~~ 1
~~8~~ ~~7~~ (14. sh. $\frac{1}{4}$
~~4~~ ~~4~~

Or otherwise by the rules of practise first for $\frac{2}{4}$ of a yarde whiche is $\frac{1}{2}$ of a yarde, you muste take the $\frac{1}{2}$ of 19 s. which is 9, s. 6, d. then for $\frac{1}{4}$, take the $\frac{1}{2}$ of the product, that is to saye, of 9, s. 6, d. and therof cōmeth 4, s. 9. d. adde these nōbers togither, & you shall haue 14, s. 3, d. as aboue is sayd, and as appeareth here in the margent.

16. shil.
9. sh. 6. d.
4. .0.
14. .3, d.

If $\frac{3}{4}$ of a yarde of Veluet do cost 14. shil. 3. d. What shall 1. yarde coste, set your nombers downe thus: if $\frac{3}{4}$ | 14 $\frac{1}{4}$ | $\frac{1}{1}$. Reduce 14, $\frac{1}{4}$ into a fraction, and they will be $\frac{57}{4}$ thē multiply 57. by 1. 4, times, & thereof cōmeth 228. for your diuidend. Likewise multiply 1. times

4. 3.

4, 3, times, & therof cõmeth 12, for your diuisor: then diuide 228 by 12. & your quotient will be 19. shil. so much is the yarde of veluet worth.

	57	1
$\frac{3}{4}$ |	14 $\frac{1}{4}$ | $\frac{1}{1}$	1 0
		2 2 8 (19. shil.
		1 2 2
		1

Or otherwise by ẏ rule of practise: you shall take the $\frac{1}{3}$ parte of 14, sh. 3. d. and adde it with the same 14, sh. 3, d. and you shall haue 19, shill. as before.

14. *shil*	3. d.
4.	.9. d
19. *shil.*	.0. d.

If one elle of Hollonde clothe be worth 5, s. what are $\frac{2}{3}$ worth after the rate? Aunswere: say thus if $\frac{1}{3}$ | $\frac{5}{1}$ | $\frac{2}{3}$. Then multiply 2 times 5, one time, and therof commeth 10, for your diuidende: likewise multiply three times 1 one time, they make 3, for your diuisor, then diuide 10, by 3. & thereof commeth 30. s. $\frac{1}{3}$ which $\frac{1}{3}$ is worth 4. pẽce, &

so

so much are the $\frac{2}{3}$ of an ell worth.

$\frac{1}{1}$ | $\frac{5}{1}$ | $\frac{2}{1}$ | 1

~~1~~ ~~0~~ (3.shil. $\frac{1}{3}$

~~3~~

Or otherwise, by the rule of practise: take first the $\frac{1}{3}$ of 5. s. for the $\frac{1}{3}$ of an ell, which is 1.s. 8.d. Likewise, for the other $\frac{1}{3}$ of an ell take againe another $\frac{1}{3}$ of 5.s. which is also 1.sh.8,d. and adde them together, and so shall you haue 3.s.4.d. as before.

5.shil.	
1.	.8
1.	.8.
3.shill.	4 d.

If $\frac{2}{3}$ of an ell of Hollande cloth doe cost me 3.s.4.d. what shal the el cost? Aunswere: set down your sūme thus, if $\frac{2}{1}$ | $3\frac{1}{3}$ | $\frac{1}{1}$. Firste reduce $3\frac{1}{3}$ all into thirds, and it will be $\frac{10}{3}$. Then multiply 1. times 10. 3. times, and thereof cōmeth 30. for your diuidēde. Likewise multiplie 1. times 3. 2 times, your quotiēt wil be 6. then diuide 30, by 6. & you shall haue 5,s. so much is the ell

of

of Hollande clothe worthe.

	10		~~8~~ ~~0~~
$\frac{2}{3}$	$3.\frac{1}{3}$	$\frac{1}{1}$	~~6~~ 5. shil

Or otherwise by practise, take the $\frac{1}{2}$ of. 3. s. 4. whiche is. 1. s. 8. d. and adde it to thesame 3. s. 4. d. and thereof will come. 5. as before. For the $\frac{1}{3}$ of. 5. s. is as muche as the $\frac{1}{2}$ of 3. s. 4. pēce. whiche was the price that the $\frac{2}{3}$ of an elle did coste, as appereth.

3. shil.	4.
1.	8.
5. sh.	0. d.

If one elle coste me. 17. s. what shal 15. elles $\frac{1}{8}$ part coste? Whiche $\frac{1}{8}$ is halfe a quarter of an elle. Aunswere: saie, of $\frac{1}{1}$ | $\frac{17}{1}$ | 15. $\frac{1}{8}$. First reduce 15. $\frac{1}{8}$ into. 8. partes, and thei make $\frac{121}{8}$, then multiplie 121. by. 17. 1. tyme, and thereof cōmeth 2057. for your diuidende. Likewise multiplie. 8. times. 1. 1. time, and your quotiente will bee. 8. for your diuisor, then diuide. 2057. by. 8. and you shall find. 257. shillynges $\frac{1}{8}$, which is. 12. li. 17. shillynges. 1. penie $\frac{1}{2}$, and so muche are the. 15. elles $\frac{1}{8}$ worthe, as by practise doeth appere.

121

1/2	17/1	15 1/8

Or otherwise, for 10. s. take the 1/2 of 15, which is 7 li. 10. s. then for 5 s. take the 1/2 of 7 li. 10 s: which is 3 li. 15 s: thirdly, for 2: s: take 1/5 of 7 li: 10: s: because the 1/5 of 10. s: is 2: s: Fourthly, for the 1/8 of the ell, you shal take the 1/8 of 17: s: whiche is 2: s: 1: d: 1/2: Lastlie, adde all these sõmes together, and then shall you finde 12. li. 17: s: 1: d: 1/2 as before, and as appereth more plainly in the margent.

15	1/8
17. s:	
7:	10: .
3.	15 .
1.	10 .
	2. 1 1/16
12: li: 17: s. 1: d: 2/16	

If 25 elles bee worthe 2. li: 3: s: 4: d: what are 18 elles 1/4 worth by the price? Answer: first put 3. s. 4. d. into the part of a li. and you shall haue 1/6, then sate, if 25/1 gene me 2 li. 1/6 what shall 18 3/4 gene: put the whole nomber into his brokē, and then multiplie 1 tymes 13 by 75: the product will be 975 the which you shall diuide by 25 tymes 6: 4 tymes, whiche

which maketh 600. Then diuide 975 by 600, and your quotient will be 1 li. and 375. remaineth, the which 375. you shal multiply by 20. thereof commeth 7500. diuide the same by 600. youre quotient wil be 12. s. & 300. remaineth ỹ which abreuiated bringeth ½ whiche is 6. d. thus the 18. elles ¼ are worth 1. li. 12. s. 6. d. as by practise appeareth.

13	75
2 ½ | 2 ½	18 ¼.

Or otherwise by the rules of practise: for because that 12. elles ½ is the ⅕ of 25. elles, therefore take the ½ of 2. li. 3. s. 4. d. which is. 1. li. 1. s. 8. d. then for 9. elles ¼ take the ¼ of 2. li. 3. s. 4. d. or else the ½ of the last product (that is to saie of 1. li. 1. s. 8. d.) whiche is all one, and adde them together, so shall you haue 1. li. 12. s. 6. d: as before.

.2.	.3.	.4.
.1.	.1.	.8.
	.10.	.10.
1. li.	12. s.	6. d.

If. 15. yardes be woꝛthe. 32. s. what are half a yard, oꝛ half a quarter, oꝛ els $\frac{3}{8}$ of a yarde woꝛthe. Aunſweꝛe: ſaie, if $\frac{15}{1}$ geue $\frac{32}{1}$ what will $\frac{3}{8}$ geue? Multiplie I times 32. by 3, and diuide the pꝛoduct by. 15. tymes. 1. s. and 4, remaineth, whiche is $\frac{1}{5}$ of a ſhi. that is to ſaie 4. d and ſo muche are $\frac{3}{5}$ of a yarde woꝛthe.

$\frac{15}{1} \mid \frac{32}{1} \mid \frac{3}{8}$

Otheꝛwiſe, ſee what the yarde is woꝛthe, after the maneꝛ afoꝛeſaied in the other eꝛamples, and you ſhall find that the yarde is woꝛthe, 2. s. 1. d. $\frac{3}{5}$ of the whiche nomber take fiꝛſt the $\frac{1}{2}$ foꝛ $\frac{4}{8}$, whiche is 1. s. 0. d. $\frac{4}{5}$, of the whiche nomber, take the $\frac{1}{4}$ foꝛ the other $\frac{1}{5}$, whiche is 3. d. $\frac{1}{5}$, adde theſe. 2. nombers together, and you ſhall finde the $\frac{3}{8}$ to be woꝛthe 1. s. 4. d. as beloꝛe is ſaied.

2. ſhil.	1. d.	$\frac{3}{5}$.
1.	0.	$\frac{4}{5}$.
1. ſhil.	4. d.	0.

If 13 eis $\frac{6}{5}$, be woꝛthe 27. s. what are 10 elles $\frac{2}{3}$ woꝛthe by the pꝛice? Aun-

ſweꝛe:

ſwere: ſaie if $13\frac{5}{6}$ gene $\frac{27}{1}$, which ſhal $10\frac{2}{5}$ gene: putte the whole nombers into their broken, and you ſhall finde $\frac{83}{6}, \frac{27}{1}$, end $\frac{32}{1}$. Then multiplie 6 tymes 27 by 32 and thereof cõmeth 5184 the which nomber you ſhall diuide by 83 tymes 1 thre times, and you ſhall finde 20.s. $\frac{68}{83}$ whiche is worth 9.d. $\frac{69}{85}$ part of a peny.

83		32
$13\frac{5}{6}$	$\frac{27}{1}$	$10\frac{2}{5}$

If two yardes $\frac{1}{2}$ be worthe 4.s.8.d. what are 8 yardes $\frac{1}{4}$ worthe: Aunſwer put the 8.d. into the part of a ſhillyng, which wilbe $\frac{2}{3}$, then reduce the whole nombers into their broken, and thei will ſtand thus, $\frac{5}{2}, \frac{14}{1}, \frac{33}{4}$, then multiplie twoo tymes 14 by 33, and diuide the produce by 5. tymes 3.4. tymes, and you ſhall finde 15. s. 4.d. $\frac{4}{5}$, ſo muche are the eight yardes $\frac{1}{4}$ worthe.

5	14	33
$2\frac{1}{2}$	$4\frac{2}{3}$	$8\frac{1}{4}$

If one Kerſey bee worthe 2.li.6.s. 8.d. how many Kerſeis ſhal I buy for

P.iij. 36.li.

36.li.3.s.4 d.after ½ rate: Answere: put 6.s.8.d, into the parte of a li. and you shall haue 2 li.⅓ for the first nomber in the rule of 3. and 1 elle for the seconde nomber: then put 3 s.4 d: into the part of a li. and you shal finde 36 li.½ for the 3 nomber, then will your 3 nombers in the rule of 3 stand thus. 2 ⅓ | 1 | 36 ½. Therefore reduce the whole nombers into their broken, and you shall haue ⅞ | 1 | 217/2. Then multiplie 1 by 217, and thereof will come 651 for your diuidende. Likewise, multiplie 7 tymes 1 by 6, and the produce thereof will be 42. Then diuide 651 by 42. and you shall finde 15 ½. So many kerseis of 2 pounde, 6 shillinges 8 pence the pece shall you haue for. 36. pounde, 3. shillynges 4 pence.

$$\frac{7}{2\frac{1}{3}} \mid \frac{1}{1} \mid \frac{217}{36\frac{1}{2}}$$

¶ The fowerth Chapiter treateth of losses and gaines, in the trade of marchaundise.

If 13 yardes $\frac{1}{3}$ be woꝛth 22 li. 10 ſhillynges, how ſhall I ſell the yard to gaine $\frac{1}{3}$, oꝛ to make of 3. 4: whiche is all one? Anſwere: ſaie by the rule of 3, if 3 be come of 4. oꝛ if 3. yelde 4. what will 22. $\frac{1}{2}$: multiplie and diuide, and you ſhal find 30. li. Then ſaie again by the rule of 3. if 13 yardes $\frac{1}{3}$ doe geue 30. li. aſwell of pꝛincipall as of gain: what will 1 yard be woꝛthe by the pꝛice? Multiplie and diuide, and you ſhall finde 2. pounde 5 ſhil. and ſoꝛ that pꝛice muſt the yard be ſold to gaine the $\frac{1}{3}$, oꝛ to make of 3. 4.

$\frac{3}{4}$ | $\frac{4}{3}$ | 45 / $22\frac{1}{2}$ || 40. / $13\frac{1}{3}$ $\frac{30}{1}$ | $\frac{1}{1}$

Oꝛ otherwiſe, take the $\frac{1}{3}$ part of 22. li. 10. s. which is 7. l. 10. s. that ſhal you adde with 22 pounde 10 ſhillynges, & you ſhall haue 30 pound as befoꝛe. Then diuide 30. by 13. $\frac{1}{3}$. and you ſhall finde 2 pounde 5 ſhillynges, as aboue is ſaied.

22.	10. s.
7.	10.
30.	00.

If one yarde bee worthe 27.s.6.d. for how muche shall 16 yardes $\frac{3}{4}$ bee solde, to gaine 2.s vpon the poonde of money, that is to saie: vpon 20.s. Answere: adde 2 vnto 20 & you shall haue 22, then saie: if 20.s. of principall, doe geue 22.s. alwei of principal as gain: howe muche will 27.s.6.d. principall yeld. Multiplie and diuide & you shall find 30.s.$\frac{1}{4}$: then saie again by the rule of 3, if 1. yard do geue me 30.s $\frac{1}{4}$ (which is alwell the principall as the gaine) what shal 16 yardes $\frac{3}{4}$ geue me? Multiplie and diuide, and you shall finde 25.li.4.s.2 d. For the same price shall the 16 yardes $\frac{3}{4}$ be solde to gaine after the rate of 2.s vpon the pound of money, or in 20.s. whiche is all one.

		55			121		50
$\frac{20}{1}$	$\frac{22}{1}$	27$\frac{1}{2}$.		$\frac{1}{1}$	30$\frac{1}{4}$		16$\frac{3}{4}$

If 10 yardes $\frac{3}{4}$ be worthe 25.li.10.s For how muche shall 2 yards $\frac{1}{4}$ be solde to gaine after 10.li. vpon the 100.li. of money? Answere: saie if 100 of principall

pall yeld 110 aswell principall as gain how muche will 25.li.10.s. yelde me? Multiplie and diuide, and you shall finde 28.li.1.s. Then saie if 10 yardes $\frac{2}{3}$ doe yeld me 28.li.1.s. aswell of principall as of gaine, how muche shall. 2. yardes $\frac{1}{4}$ yelde me? Multiplie and diuide, and you shall finde 5.li. 18.s. 4.d. $\frac{1}{12}$, for so muche shall the twoo yardes be solde, to gaine after 10.li. vpon the 100.li. of money.

$$\frac{100}{1} \mid \frac{100}{1} \mid \overset{51}{\overline{25\tfrac{1}{2}}} \mid \mid 10\tfrac{2}{3} \mid 28\tfrac{1}{20} \mid 2\tfrac{1}{4} \mid$$

And although that in these questions of gaine and losse, sometymes the firste nōbers is not like vnto the third nomber, that is to saie, of thesame denomination; as one would saie: if 20. shillynges gaine. 2. shillynges, what shall. 50.li. gaine? Or 25.li. &c. Or if 20.li. doe gaine 2.li. What shall 25.s. gaine me, or what shall. 27.s. gaine? Yet neuerthelesse, the rule is not therfore false. For if 20.s. dooe gaine 2.s:

20.li. shall gaine 2.li. and 20.d. shall gaine 2, d. likewise 20 crounes shall gaine 2 crounes, and so of all other: therefore it is to bee understande, that the first nōber in these reasons, is presupposed to be semblable to the thirde.

When one marchaunt selleth wares to an other, and he geueth to the buyer 2 vpon 15: how muche shall the buyer gain vpō the 100 after the rate? Answere: saie if 15 geue 17, what shall 100 geue? Multiplie and diuide, and you shall finde $113\frac{1}{3}$, so the buyer getteth after the rate of $13\frac{1}{3}$ vpon the 100.

15 | 17 | 100

If 1. Northe dosen cost me 3 li. 5 s. & I sel ẏ same again for 3.li. 12.s. 6 d. how muche do I gain vpō the li. of money after the rate. Answere saie if 3.li. $\frac{1}{4}$ do geue 3.li $\frac{5}{8}$, what shall $\frac{20}{8}$ geue, put the whole nōber into their broken, & you shall haue $\frac{13}{4}$, $\frac{29}{8}$, $\frac{20}{1}$, then multiplie 4 tymes 29, by 20, & therof commeth 2320 for your nomber that is to be diuided, likewise multiplie 13 times 8.1 time, & thereof

therof cõmeth 104. Then diuide 2320 by 104, and you shall finde 22 shillinges $\frac{4}{13}$. So I shall get 2 shillynges $\frac{4}{13}$ vpon 20 shill. or vpon the li. of money.

13	29	
$3\frac{1}{4}$	$3\frac{1}{8}$	$\frac{29}{1}$

If a yarde of clothe coste me 7 shillynges 8 pence, and afterward I deliuer out 13 yardes $\frac{1}{4}$, for 4 pounde 13. s. 4 pence. I would know whether I do winne or lose, and how muche vpon the 100 pounde of money? Answere: se first at 7 shillynges 8 pence the yarde, what the 13 yardes $\frac{1}{4}$ shall cost, and you shall finde 5 pound 1 shil. 7 pence. And I solde them but for 4 pounde 13 shil. 4 pence, so that I dos lose vpon the 13 yardes $\frac{1}{4}$ the summe of 8 shilly. 3 pence. Then for to knowe how muche is lost vpon the 100 I saie by the rule of 3, if 5. pound 1 shil. 7. pence dos lose 8 shil. 3. d What shall 100 lose? First put 1 shill. 7 pence into the part of a pounde, and it will be $\frac{13}{240}$. Likewise put 8 shill. 3. d. into the part of a li. and it is $\frac{11}{80}$. Then

will

will your nomber ſtande thus 5. $\frac{19}{240}$, $\frac{39}{50}$, $\frac{100}{1}$, put the whole into his broken, and then multiplie and diuide, ſo you ſhall finde 8.li. $\frac{1184}{3753}$, whiche is woꝛthe 2. ſhillynges. 5.d. $\frac{169}{1219}$ and ſo muche is loſt vpon the 100.li. of money.

1219.

5 | $\frac{19}{240}$. | $\frac{73}{50}$ | $\frac{100}{1}$.

Moꝛe, if 12 yardes $\frac{1}{2}$ of Scarlet bee ſolde foꝛ 30 pounde 15 ſhillynges, vpō the whiche is gained after the rate of 11 $\frac{1}{3}$ vpon the 100. I demaunde what the yarde did coſte at the firſte. Aunſwere: from 30 pounde 15 ſhillynges, ſubſtracte his $\frac{1}{10}$ part, whiche is 3.li.1.s 6.d. and there reſteth 27.li.13.s. 6.d. the whiche nomber multiplied by. 2. bꝛyngeth 55.li.7.s. of the whiche is 11. pounde, one ſhillyng and foꝛer pēce. Then take againe the $\frac{1}{5}$ of theſaied 11 pounde 1 ſhillyng 4 pence, whiche is 2 pounde foꝛer ſhillynges thꝛee pence, $\frac{2}{25}$. And ſo muche did the elle coſt at the firſte penie.

30.li.

30.li.	15.ſhil.			
3.	1.ſhil.	6.d.		
27.	13.	6.		
2.				
55.	7.			
11.	1.	4.	$\frac{4}{5}$.	
2.	4.	3.	$\frac{8}{55}$.	

Woze, if 15 yardes $\frac{1}{4}$ of Scarlette doe coſt me 32 pound 13.s, 4.pence. And I ſell the yarde again foz 2 pound, whether doe I winne oz loſe, and howe muche vpon the pounde of money.

Anſwere: loke what the 15 yards $\frac{1}{4}$ are wozthe at 2.li.the yarde, and you ſhall find that thei are wozth 31.l.10.s. But thei did coſt 32.li.13.s.4.d. ſo that there is loſt vpō the whole 1.li.3,s 4.d. Thē to knowe howe muche is loſt vpon the li. ſaie by the rule of 3, if 32 li. $\frac{3}{8}$ doe loſe 1 li. $\frac{1}{6}$: what will $\frac{1}{3}$ loſe? That is to ſaie: what will 1 li.loſe? Reduce the whole nombers into their bzoken, and then multiplie and diuide, ſo ſhal you finde $\frac{21}{192}$ parte of a li. Then multiplie 21 by

240. because so many pence are in a li. and deuide the produce by 588. so shall you finde 8.d. $\frac{3}{5}$ $\frac{3}{8}$ $\frac{5}{8}$ which beyng abreuiated doe make $\frac{4}{7}$, and thus you se that 8.d.$\frac{4}{7}$ is lost vpō the li. of money.

$$\frac{98}{32\ \frac{3}{3}} \quad \frac{7}{1\ \frac{1}{7}} \quad \frac{1}{1}$$

If 1. yarde of cloth of tissue be solde for 3.li.15.s. wherupon is lost after the rate of 10.s. vpon the 100. I demaund what 12. yardes $\frac{1}{2}$ of the same tissue did cost? Aunswere: adde vnto 3.li.15.shys owne $\frac{1}{10}$ part, whiche is 7.s.6.d. and al amounteth to 4.li.2.s.6.d. then looke what the 12. yardes $\frac{1}{2}$ will amount vnto, after 4.li.2.s.6.d. & you shall finde that they will come to 51.li.11.s.3.d. so muche did the 12. yardes $\frac{1}{2}$ coste.

3.li.15.s.	12.	$\frac{1}{2}$
7.s.6.d.	4.li.2.s.6.d.	
4.li.2.s.6.d.		
	48. .00.	.0.
	1. .10.	.0.
	2. .10.	.3.
	51.li 11.s.	3.d.

More

More, if I sell 1 Wilshire white for 6 li. 12 s. whereupon I doe gain after the rate of 2 shil. vpon the li. of money, that is to saie, vpon 20 s. I demaunde what 11 peeces of the same whites did cost me? Answere: abate from 6 pound 12 s. (whiche is 132 s) his $\frac{1}{11}$ parte, and thereof cōmeth 12 s. and there remaineth 120 s. or. 6 li. Then se at 6. li. the clothe, what the 11 clothes are worthe and you shall finde them to be worthe 66 li. so muche did the 11 clothes coste.

132. shil.	11
12. shilly.	6
120. shil.	66. li.

If I sel 10 elles $\frac{1}{2}$ of Hollād for 22 s. 6 d. wherupon I doe lose after the rate of 2 s. vpon the li. of money. I demaūd what the ell did cost me? Answere: saie by the rule of: 3, if 18 geue 20 :s. what will 20 s: 6: d: geue? Multiplie and diuide, and you shall find 25 s: Then diuide 25 s. by 10 $\frac{1}{2}$, and thereof commeth 2 shil. 4. d. $\frac{4}{7}$. So muche did the ell cost

$\frac{11}{2}$	$\frac{20}{1}$	22 $\frac{1}{2}$	If

If I ſell 1 clothe for 5 li. wherupon I do loſe 10 vpō the 100, I demaunde how muche I ſhould loſe or gaine vpon the 100, in caſe I had ſold the ſame for 5 li. 10. s. Anſwere: ſaie, if 90 yelde 100, how muche will 5 li. geue. Multiplie and diuide, and you ſhall finde 5 li. $\frac{5}{9}$: then ſaie again by the rule of 3, if $\frac{5}{9}$ come to $5\frac{1}{2}$, what will 100 come vnto? Multiplie and diuide, and you ſhal finde 99 li. whiche beyng abated from 100. there will remain 1 pounde, and ſo muche is loſte vpon the 100.

90. 100. 5. || $5\frac{5}{9}$ | $5\frac{1}{2}$ | $\frac{100}{1}$ |

¶ The fifte Chapiter treateth of lengthes & breadthes of tapiſtrie, and other clothes.

If a peece of Tapiſtrie bee 5 elles $\frac{1}{4}$ longe, and 4 elles $\frac{3}{4}$ in breadth, how many ells ſquare doeth the ſame pece containe? Anſwere: multiplie the length by the breadth, that is to ſaie $5\frac{1}{4}$ by $4\frac{3}{4}$, and therof cōmeth 26 elles $\frac{1}{16}$, ſo many elles ſquare

ſquare doth the ſame peece conteine.

More, if a peece of Tapiſtrie doe conteine 32. elles ſquare, and the ſame being in length 6 elles $\frac{1}{4}$. I demaũde howe many elles in breadth the ſame peece doth conteine. Aunſ. diuide 32. elles by $6\frac{1}{4}$ and thereof commeth $5.\frac{3}{25}$: So manye elles dothe the ſame peece conteine in breadth.

More, a peece of clothe beynge 13. yardes $\frac{1}{3}$ in length, and 5, quarters $\frac{1}{2}$ in breadth, howe many yardes of $\frac{2}{3}$ and $\frac{1}{3}$ broade will the ſame peece make? Anſwere: ſee what parte of a yarde, the $\frac{1}{4}$ and $\frac{1}{2}$ be, and you ſhall finde that they make 1 yarde $\frac{3}{4}$. Then multiplye 13 yardes $\frac{1}{3}$ by 1 yarde $\frac{3}{4}$ and you ſhall haue 18. yardes $\frac{1}{3}$ in ſquare the whiche you muſt diuide by $\frac{2}{3}$ & $\frac{1}{3}$ that is to ſaye by $\frac{1}{6}$, (becauſe the $\frac{2}{3}$, $\frac{1}{2}$ beinge brought into 1 fraction maketh $\frac{1}{6}$) and you ſhall finde 22. yardes: So many yardes of $\frac{2}{3}$ & $\frac{1}{3}$ large doth the ſame peece conteine.

More, a marchant hath bought 4. yardes $\frac{2}{3}$ of cloth beinge syre quarters $\frac{1}{2}$ broade to make hym a gowne the whiche he will line thorowout, wyth black Say of three quarters of a yarde broad, I demaund how much Say he must bye? Aunswere: Multiplye the length of the cloth, by the breadth, that is to say 4 $\frac{2}{3}$ by 1 $\frac{5}{8}$, (which is the syx quarters $\frac{1}{2}$) and thereof commeth 7. yardes $\frac{7}{12}$, the which diuide by $\frac{3}{4}$ and you shal finde ten yardes $\frac{1}{9}$. So many yardes of Say must he haue to line the same 4 yardes $\frac{2}{3}$ of clothe of 6. quart. $\frac{1}{2}$ broad.

More, at 6, s. 8, d. the elle square, what shall a peece of tapistrie cost me, which is fiue elles $\frac{1}{2}$ lōg and 4, elles $\frac{1}{4}$ broade? Aunswere, multiply 5, $\frac{1}{2}$ by 4, $\frac{1}{4}$ and therof cōmeth 23 elles $\frac{3}{8}$ square: then say by the rule of three, if one elle square cost me 6, s. 8, d. what shal 23 $\frac{3}{8}$ cost? Multiplye and diuide, and you shall finde 7 li. 15. s. 10 d. so muche the said peece of tapistrie did cost.

Or otherwiſe, by the rules of practiſe, take the $\frac{1}{3}$ of 23. $\frac{3}{5}$: and you ſhall finde 7.li.15.s.10.d. as aboue is layde.

More, a peece of Hollande cloths conteining 42.elles $\frac{2}{3}$ Flemiſh, howe many elles Engliſhe doe they make? Here muſt you fyrſt note that 100.els Flemiſh, do make but 60.elles Engliſhe, and ſo conſequentlye fiue elles Flemiſhe do make but 3.els Engliſh. Therfore ſay by the rule of 3. if 5. elles flemiſh doe make three elles Engliſh, how many elles Engliſh will 42. els $\frac{2}{3}$ Flemiſh make. Multiply and diuide ſo ſhall you finde 25. elles $\frac{1}{2}$ Engliſhe, and ſo many elles Engliſhe doth 42. $\frac{2}{3}$ Flemiſh conteine, the lyke is to be done of all others.

More, I haue boughte a peece of Tapiſtrie, being 5. elles $\frac{1}{4}$ longe, and 4. elles $\frac{2}{3}$ broade meaſure of Flaunders, I demaunde howe manye elles ſquare it maketh Engliſhe meaſure?

Aunſwere:

Firſt, forasmuch as three elles englisch are worth 5 elles flemiſhe, therefore put 3 elles englisch into hys ſquare, in multiplyng 3. by himſelf whiche maketh 9: likewiſe multiplye 5. in hymſelfe ſquarely, and it wilbe 25. Then multiplye $5\frac{1}{4}$ whiche is the length of the peece, by $4\frac{2}{3}$ which is the breadth, & therof cōmeth 26 elles $\frac{1}{6}$ ſquare, then ſay by ỳ rule of three, if 25 elles ſquare of flemiſhe meaſure, be worth 9 elles ſquare of engliſhe meaſure, what are 26 elles flemiſh $\frac{1}{6}$ worth: multiply and diuide, and you ſhall finde that they are worthe nine elles $\frac{33}{50}$ ſquare of engliſh meaſure.

More at 3.s.6.d. the ell flemiſh what is the engliſhe ell worth after ỳ rate. Anſwere: ſaye if 5. elles flemiſhe bee worth three ells engliſh, what is 1 ell flemiſhe worth: multiply and diuide, & you ſhall fynde $\frac{1}{5}$ of an engliſhe ell. Then ſaye by the rule of 3, if $\frac{1}{5}$ of an engliſh ell, be worth 3 s. 6 d. what is 1. engliſhe ell worth: multiplye and diuide,

diuide, and you ſhall finde 5 s.10.d. ſo much ſhall the engliſhe ell be woꝛth.

Woꝛe at 6 s.& d. the flemiſhe elle ſquare, what is the engliſh ell woꝛth. Aunſwere: ſay by the aboꝛeſaid reaſō, if 25 elles flemiſhe ſquare, be woꝛth 9. elles ſquare engliſhe, what is one ell ſquare flemiſhe woꝛth? multiply and diuide, & you ſhall finde $\frac{9}{25}$ of a ſquare engliſhe elle: Then ſaye, if $\frac{9}{25}$ of an engliſhe elle be woꝛth 6 s.&.d. what is one ſquare elle engliſhe woꝛth? multiplie and diuide, and you ſhall fynde 18.s.6.d. $\frac{2}{3}$, ſo muche ſhal one engliſhe elle ſquare be woꝛth.

¶The ſixt Chapter treateth of the reducing of the paumes of Genes into engliſhe yardes, wherof foure Paumes maketh one engliſh yarde.

I haue bought 97. paumes $\frac{1}{3}$ of Genes veluet, & I would know howe manye yardes they will

make? Aunſwere, Diuide 97. ½ by 4. and you ſhall haue 24. yardes ¼. So manye yardes doe the 97. paumes ½ conteine.

Or otherwiſe, take ſome other nõber at your pleaſure, as 20. paumes, which doe make fiue yardes, and then ſay by the rule of three, if 20/1 paumes, giue 5/1 yardes, what will 97. ½ giue? Multiplye and diuide, and you ſhall finde 24. yardes ¼ as before.

More, at two ſhillings 7. d. ♄ paume of Genes, what wil the Engliſh yarde be worth after the rate? Aunſwere, ſay by the rule of three, if ¼ of an Engliſh yarde bee worthe two ſhillings 7/12. What is 1/1 yarde worth? Multiplie & diuide, and you ſhall finde ten ſhillings 4. d. So muche is the Engliſhe yarde worth.

Or otherwiſe, multiply 4. paumes (which is one yarde) by two ſhillings 7. pences, and you ſhal finde 10. s. 4. d. as before.

If 257. Paumes $\frac{1}{2}$ bee worth 20. li. 16. s. 8. d. What is one yarde worthe after the rate? Annswere, saye: by the rule of 3, if 257, $\frac{1}{2}$ paumes be worthe 20. $\frac{5}{6}$, what are $\frac{4}{1}$ paumes worth. Multiply and diuide, and you shall fynde $\frac{309}{309}$ part of a pounde, which is worthe 6 s. 5. pence, $\frac{69}{103}$: so much is one yarde worthe.

¶ The vij. Chapter treateth of marchaundise solde by waight.

AT 9. d. $\frac{1}{2}$ the ounce, what is the li. waight worth? Answere, say if $\frac{3}{1}$ giue 9. $\frac{1}{2}$ what will $\frac{16}{1}$ gyue multiply and diuide, & you shal finde 12. s. 8 d. so much is the yarde worth?

Or otherwise, by the rules of practise for syre pence, take the $\frac{1}{2}$ of 16. which is 8. s. then for 3. d. take the $\frac{1}{4}$ of 16. s. whiche is 4. s. Finally, for the halpenye, take 16. ob. which are 8. d. adde all these nombers togither and you shal finde 12. s. 8. d. as before.

Woze at 10 d. ½ the ounce, what are 112. li. waight woꝛth after the rate? Aunſwere: reduce 112. li. into ounces: in multiplying 112. li. by 16. ounces ye ſhall haue 1792. ounces, then ſay by the rule of 3. if 1 | 10½ | 1712: Multiplie and diuide, and you ſhall finde 18816 d. whiche do make 78. li. 8. s. and ſo much are the 112. li. woꝛth after 10. d. ½ the ounce.

At 12. s. 8. d. the li. waight, what is the ounce woꝛth? Aunſwere: put 12. s. 8 d. into pence, and you ſhall haue 152. pence: then ſay by the rule of 3. if 16. ounces coſt 152. d. what ſhall 1. ounce coſte, multiplye and diuide, and you ſhall finde 9. d. ½, ſo much is the ounce woꝛth.

Or otherwiſe, take the ¼ of 12 s. 8. d. for 4. ounces, and thereof commeth 3. s. 2. d. then for one ounce, take the ¼ of 3. s. 2 d. and you ſhall haue 9. d. ½ as before.

At 32. li. 10. s. the quintall, that is to ſaye,

ſaye, the 100.li. waight what is 1. li. waight worthe after the ſame rate?
Aunſwere: Put 32.li.12.s.al into ſhillings and you ſhal haue 650.s.
Then ſay, by the rule of three, if 100 | 650 | 1. multiply and diuide, and you ſhall finde, 6 s.6.d. ſo muche is the li. worthe.

If one pound waight of ſaffron do coſt me 18.s. 8 d. what ſhall 355. li. 10. ounces coſt me by the ſame price?
Aunſwere, ſaye by the rule of 3. if $\frac{1}{3}$ | 18 $\frac{2}{3}$ | 355 $\frac{5}{8}$. Multiply and diuide, and you ſhall finde 331.li. 18.s. 4.d. ſo much are the 355.li. ten ounces worth.

Brief rules of waight.

WHo that multiplieth the price that 1.li. waight is worth by 5, & diuideth the product therof by. 12. hee ſhall finde howe manye pounds in mony the quintal is worth that is to ſaye, howe much the 100. li. waight is worth.

And contrariwiſe he that multiplieth

eth the pounds of money that the 100 waight is worth by 12. and deuide the product by 5. and you shall synde howe many pẽce the pound waight is worth.

¶ Example.

AT seuentene pence the pounde waight, what is the 100 pounde waight worth? Aunswere, Multiplie 17. by 5, and thereof cõmeth 85. diuide the same by 12. and you shall finde 7. pound $\frac{1}{12}$, whiche $\frac{1}{12}$ is worth one shilling and eight pence. So much is the 100 pounde waight worth.

Note, at 13, li. the 100 li. waight, what is one pounde waight worth? Aunswere, Multiplie 13. by 12. amounteth to 156. the whiche diuide by 5. and you shal finde 31. li. $\frac{1}{5}$ which is 2. s. 7 d. $\frac{1}{5}$ and so muche is one pounde waight worth.

The lyke is to be done of yardes, elles, or of any other measure, when we recken but fyue score to the hundred.

Briefe Rules for measure.

Who

Who that multiplieth the pence that one ell is worthe, by 6. And diuideth the product by 12. he ſhall fynde how many pounde in money the 120. elles are worth, which 120 elles we count but for a C.

And contrariwiſe, he that multiplieth the pounde in money that the 120 elles are worth by 12, and diuideth the multiplication by 6, ſhall fynde howe many pence the ell is worthe.

Example.

At ten pence the ell, what are 120. elles worth? Anſwere, multiplie 10.d. by 6. and thereof commeth 60: The which diuide by 12. and you ſhall find fyue pounde, ſo many pounds in money are 120. elles worthe 10.d. the ell.

Note. If 9. pounde, the 120. elles, what is one elle worthe? Anſwere, multiplie nine pound by twelue, and thereof commeth 108, the which diuide by 6. and you ſhal finde 18.d. ſo much is one elle worth.

The like is to be done of all ma-

mer

ner of wares, which are ſold after 120. for the hundred.

¶ Briefe Rules for the hundreth waight here at London, whiche is after 112. li. for the C.

WHo that multiplieth ỹ pence that one pounde waight is worthe by 28. and diuideth the product by 60. ſhall finde howe many pounds in money the 112. li. waight is worth.

AND contrariwiſe, he that multiplied ỹ pounds in money that the 112. li. is worth by 60. and diuideth the product by 28. ſhal finde howe manye pence one li. waight is worth.

Example.

AT nine pence the pounde waight, what is the 112. li. waight worth? Anſwere, multiplie 9. d. by 28. and thereof cõmeth 252. the whiche diuide by 60. and you ſhal finde 4. li. $\frac{12}{60}$ which beinge abbreuiated is $\frac{1}{5}$ of a pounde, whiche is worthe 4. s. And thus the 112. li. 2. is worth 4. pound 4. ſhil.

At

At 8 li. the 112. li. waight, what is 1. li. waight worth? Answere, Multiplie 8 li. by 60, and thereof commeth 480, the whiche diuide by 28. and you shall finde 17. d. $\frac{1}{7}$: so muche is 1. li. waight worth.

¶ The. viij. Chapter treateth of tares and allowances of marchaundise solde by waight:

AT 12 li. the 100. suttell, what shall 987 li. suttell be worth? in giuing 4 li. waight vppon euery 100 for tret? Answere, adde 4 li. vnto 100. & you shall haue 104. Then say by the rule of thre, if 104. be worth 12. li. what are 987 li. waight worthe? multiply & diuide, & you shall finde 113, li. $\frac{21}{25}$ which is worthe 17. s. 8. d. $\frac{4}{13}$. So much shal ỹ 987. li. waight be worth.

| 104. | 12. | 987.

At 6, s. 8. d. the pound waight what shall 345, li. $\frac{1}{2}$ be worth in giuing 4, li. waight vpon euery 100, for the tret. Answere, see first by the rule of thre, what

what the 100 pound is worth ſaying, if $\frac{1}{1}$ | $6\frac{1}{3}$ | $\frac{100}{1}$ Multiplie and diuide, and you ſhall finde 33. li. $\frac{1}{3}$ then adde 4. li. vnto 100, & they are 104. then ſay again by the rule of 3. if a 104. li. be ſold for 33. li. $\frac{1}{3}$ for how muche ſhall 345. li. $\frac{2}{3}$ be ſolde? multiply & diuide, and you ſhal finde 110. l. 14. s. 8. d. $\frac{12}{13}$ So much ſhal the 345. li. $\frac{2}{3}$ be worth, at 6. s. 8. d. the pound, in giuing 4. vpon the 100.

More, if 100 bee worth 36. s. 8 d. what ſhall 780. li. bee worth in rebating 4 li. vpon euery 100, for Tare & Cloſe? Anſwere, Multiply 780. by 4. and therof commeth 3120. The which diuide by 100. and you ſhal haue 31. li. $\frac{1}{5}$ abate 31. $\frac{1}{5}$ from 780. and there wyll remaine 748 $\frac{4}{5}$. Then ſay by the rule of three, if $\frac{100}{1}$ do coſt 36. $\frac{2}{3}$, what will 748. $\frac{4}{5}$ coſt after the rate? Multiplie & diuide ſo ſhall you finde 274. s. 6. d. $\frac{12}{15}$, and ſo much ſhall the 780. li. coſt, in rebatinge 4. li. vpon euery 100. for Tare and Cloſſe.

More,

Moze, whether doth he loſe moze that gineth 5 li. vpõ the 100. oz he that rebateth 5. li. vpõ the 100. foz tare and cloſſe? Anſwere. Firſt, note that hee which gineth 5. li. vpõ the 100. gineth 105. foz 100: and he which rebateth 5. li. vpon the 100. gineth the 100. foz 95. Therefoze ſaye by the rule of 3. if 105. be giuen foz 100: foz how much ſhal ỹ 100. be giuen? Multiply and diuide ¶ you ſhal finde 65. $\frac{5}{21}$: and he whiche rebateth 5. vpõ the 100. maketh but 95. of 100: ſo that he loſeth 5. vpon the 100 ¶ the other which gineth 5. vpon ỹ 100 loſeth but 4. $\frac{16}{21}$ vpon the 100. Thus he that rabateth 5. vpon the 100. loſeth moze by $\frac{5}{21}$ vppon the 100. than the other whiche gaue 5. vppon the 100. foz tare and cloſſe.

If 100. of Allum doeſt me. 26. s. 8. d. how ſhall I ſell the li. waight to gaine after the rate of 10. vpon ỹ 100. Anſwere, put 26. s. 8. d. at intereſt. ¶ you ſhal haue 320. d. Thẽ ſay by ỹ rule af 3. if 100. giue 110 what ſhal 320 giue

multi-

multiplie and diuide, and you ſhall finde 352.d. Thē ſay, if 100 li. be worth 352 d. what is 1, li. multiplye & diuide, and you ſhall haue 3, d. $\frac{26}{50}$ whiche $\frac{26}{50}$ is worth $\frac{1}{2}$, and $\frac{1}{25}$ of $\frac{1}{2}$. That is to ſaye, the pounde waight ſhalbe worth 3. d. $\frac{1}{2}$, $\frac{1}{25}$ of a halfe pennye, in gaining 10. vpon the 100.

If one pound waight doe coſt me, 6 s. 10, d. and I ſell the ſame for 7, s. 2 d. I demaund howe much I ſhould gaine vpon the 100 li, of money after the rate? Anſwere, ſay by the rule of 3. if 6, $\frac{1}{2}$ yelde 7. $\frac{1}{2}$ what will $\frac{101}{1}$ yelde? Put the whole nombers into theyr broken, the multiplie and diuide, & you ſhall finde 104 $\frac{16}{41}$ from the whiche ſubſtract 100, and there reſteth 4. li. $\frac{16}{41}$ ſo muche is gained vpon the hundred pounde of money after the rate.

More, if ons pound do coſt me 5, s. 4. d. and I ſell the ſame againe for 4, s. 9 d. I demaunde how much I ſhal loſe vpon the 100. pounde of money? ſaye, if 5, $\frac{1}{3}$ doe giue, but 4, $\frac{3}{4}$, what

ſhall

ſhall $\frac{100}{1}$ geue? Putte the whole nomber into their broken. Then multiplie and diuide, and you ſhall finde 89 $\frac{1}{10}$. the whiche you muſt ſubſtract from 100. and there will remain. 10. pound $\frac{15}{16}$, ſo muche is loſt vpõ the. 100. pound of money.

Woze, if the pounde waight doe coſt me. 3. ſhillynges. 2. pence: and I ſell it againe for. 3. ſhillynges. 4. pence, how muche ſhall I gaine vpon. 20. ſhillin. Anſwere: ſate if $3\frac{1}{6}$ geue $4\frac{1}{3}$, what ſhall $\frac{20}{1}$ geue. Multiplie and diuide and you ſhall finde 27. ſhillinges $\frac{7}{13}$: out of the whiche abate. 20. ſhillynges, and there will remaine. 7. ſhillynges $\frac{7}{13}$, whiche is. 4. pence $\frac{4}{13}$: and ſo muche is gained vpon the pound of money, that is to ſaie vpon. 20. ſhillinges.

If the pounde waight doe coſte me 4. ſhillinges. 4. pẽce, and ſell it againe for. 3. ſhillinges. 2. pence. I demaunde how muche I ſhall loſe vpõ the pounde of money: That is to ſaie, vpon. 20. ſhillynges. Anſwere: ſaie, if. 4. $\frac{1}{3}$ geue

but $3\frac{1}{6}$, what will $\frac{20}{1}$ geue, multiplie and diuide, and you shall finde. 14.s. $\frac{2}{11}$, the whiche you must abate from. 20 shillynges, and there will remaine. 5. shillinges $\frac{9}{11}$, whiche $\frac{3}{11}$, is worthe. 4.d. $\frac{8}{11}$ of a penie, and so muche is lost vpon the pounde of money.

¶The ninth Chapter treateth of certain questions, doen by the double rule, and also by the rule of three compounde.

When the quarter of Wheate doeth cost 6.s.8.d the loafe of breade waiyng. 20. ounces is solde for a ob. I demaunde that if the quarter of Wheate did cost 10 shillinges, for how muche shall the loafe of bread be sold, that wateth. 16. ounces? Answere: by the first part of the rule of .3. compounde, whiche is mentioned in the third parte of this boke, and in the seconde Chapiter of the same. Therefore sate by the same firste parte of the rule of .3. compounde, if $6\frac{2}{3}$ | $\frac{20}{1}$ | $\frac{1}{3}$ | $\frac{10}{1}$ | $\frac{16}{1}$

Then

Then multiplie the firste nomber by the seconde, and the produce thereof shalbe your diuisor. Likewise multiplie the other three nombers, the one by the other, and the produce thereof shalbe your diuidende: As thus, firste multiplie. $6\frac{2}{3}$ by. 20. and thereof commeth $\frac{400}{3}$ for your diuisor, then multiplie $\frac{1}{2}$ by $\frac{10}{1}$, and the produce thereof by $\frac{16}{1}$, so you shall haue $\frac{160}{2}$ for youre nomber that is to bee diuided, then diuide $\frac{150}{4}$ by $\frac{400}{12}$, and thereof commeth $\frac{1800}{4800}$. the whiche beeyng abbreuiated, bryngeth $\frac{3}{8}$. of a penie: and for that price muste the loafe of breade bee solde, whiche waieth firteene ounces, and the quarter of Wheate beeyng worthe tenne shillynges.

Or otherwise by the rule of three, at twoo tymes. Firste saie if $\frac{10}{1}$ ounces geue $\frac{1}{2}$, what will $\frac{16}{1}$ ounces geue? Multiplie and diuide, and you shall finde $\frac{3}{8}$, of a pennie. Then saie againe, if. 6. $\frac{2}{3}$ doe geue me $\frac{1}{2}$, what will $\frac{10}{1}$ geue? Multiplie and diuide,

and you shall finde ½ of a penie, as afore is saied.

When the cariage of one hundreth waighte of Marchaundise. 50. miles doeth coste. 5. shillinges, what shall the cariage of. 500. waight coste me for. 16. miles? Aunswere. By the firste parte of the rule of. 3. compounde, saiyng, if 100|50|5|500|16. Multiplie. 100. by 50. the produce will be. 5000. whiche shalbee your diuisor. Then multiplie 5. tymes. 500. by. 16. and thereof commeth. 40000. for your diuidende. Therefore diuide. 40000. by. 5000. and you shall finde. 8. shillynges, so muche shall coste the cariage of. 500. waight. 16. miles.

Or otherwise by the double rule of three, that is to saie, by the rule of three at twoo tymes: firste saie if. 50. miles doe paie. 5. shillinges, what shall. 16. miles paie? Multiplie and diuide, and you shall finde. 1. shilling ½. Then saie againe, if. 100. waight doe coste me. 1: shilling ½, what shall. 500. waighte

coste:

coste? Multiplie and diuide, and you shall finde 8. shillinges, as before.

When the cariage of 800. pounde waight of Marchaundise. 84. miles, doeth coste me 6. shillinges, how many miles maie I haue 64. pound waight caried for 3. shillinges. 4 pence. Aunswere, by the second part of the rule of 3. compounde: saie if $\frac{100}{1}$ | $\frac{84}{1}$ | $\frac{6}{1}$ | $\frac{64}{1}$ | $3\frac{1}{3}$.

Then multiplie the fowerth nomber $\frac{64}{1}$ by the third nomber $\frac{1}{5}$, and therof commeth $\frac{384}{1}$ for your diuisor. Likewise multiplie $3\frac{1}{3}$ by $\frac{100}{1}$, and by $\frac{14}{1}$, and you shal haue in the product $\frac{14000}{3}$. then diuide $\frac{14000}{3}$ by $\frac{384}{1}$ and you shall find 72 miles $\frac{11}{12}$ of a mile. So many miles shal the 64. pounde waight be caried, for thyes shillinges. 4. pence.

Otherwise by the rule of 3. at two tymes: first saie, if 100. waight do coste me 6. shillinges, what shall 64. poũd waight coste? Multiplie and diuide, and you shall finde 3. shillinges $\frac{21}{25}$. Then saie, if $3\frac{21}{25}$. bee paied for 84. miles cariage; for how many miles shal 3. shil-

lynges $\frac{1}{3}$ bee pated? Multiplie and diuide, and you shall finde 72 miles $\frac{11}{13}$.

If 100 horses in 100. daies do spend 180. quarters of otes: how many quarters of Otes will. 300. horses spende in. 150. daies? Aunswere: by the firste parte of the rule of three compounde: multiplie. 180. tymes. 350. by. 150. and diuide the product by. 100. tymes. 100 and you shall finde. 945. quarters. So many quarters of Otes will 350. horses spende in. 150. daies.

Or otherwise by the rule of three at twoo tymes: firste saie, if 100. daies doe yelde me. 180. quarters of Otes: what shall. 150. daies yelde: multiplie and diuide, and you shall finde. 270. quarters: then saie againe, if. 100. horses doe spende. 270. quarters of otes, how many quarters of otes will. 350. horses spende? Multiplie and diuide, as you shall finde. 945. quarters as before.

¶ The tenth Chapiter treateth of the rule of fellowship, with out any time limited.

The

THE rule of Fellowſhip is thus: you muſt ſette doune eche mannes ſomme of money that he laieth into companie, euery one directly vnder the other, the whiche you ſhall adde altogether, and the totall ſomme of all their whole ſtocke beyng thus aſſembled, ſhalbe your commõ diuiſor, to the findyng out of euery mannes part of the gaine. Then ſhall you multiplie the gaine, or els the loſſe, by eche mannes portion of money that he laied in, and diuide the productes by the ſaied diuiſor: ſo ſhall you haue in your quotient euery mannes parte of the gaine, or els of the loſſe, if any thyng be loſt.

¶ Example.

1. Two Marchauntes haue made companie together, the firſte laied in fiue hundred pounde. The ſecond put in three hundred pounde, and with occupiyng thei haue gained. 64. pound: I demaunde how muche eche mã ſhal haue of the ſame gaines, accordyng to

the money that he laied in. Answere: Adde. 500. and. 300. bothe together, which are the perceiles that thei laied in, and thereof commeth. 800. for your diuisor: then sate by the rule of three, if 300. li. (whiche is their stocke) do gain 64. li. what shall. 500. li. gain: (which is the first mānes money that he laied in) multiplie and deuide, and you shal finde. 40. li. for the first mans parte of the gaine: then saye if. 800. giue. 64. what will. 300. giue? Multiply and diuide, and you shall finde 24. li. for the seconde mannes parte of the gaine.

500.
300
800

800 | 64 | 500.

800 | 64 | 300.

Or otherwise, put 500. li. which is the first mans money that he laied in, ouer the 800 li. whiche is the whole stocke, and you shal haue $\frac{500}{800}$ which being abbreuiated, do make $\frac{5}{8}$, and suche part of the gain shal the first mā take, that is to say $\frac{5}{8}$ of 64. li. which is 40. li.

And

And conſequentlie, by the ſame manner, the ſeconde ſhal take the $\frac{3}{8}$ of 64. which is 24. pound for his part of the gaine as before.

5	00	3	00
8	00	8	00

2. Twoo Marchauntes haue compained together, the firſt put in 640. li. and he taketh $\frac{5}{8}$ partes of the gaine. I demaunde what the ſeconde Marchaunte layed in? Aunſwere. Seeyng that the firſt Marchaunt taketh $\frac{5}{8}$ of the gaine, it followeth that the ſeconde muſt haue $\frac{3}{8}$ which is the reſt, and therfore ſate by the rule of thræe, if $\frac{5}{8}$ of the gaine, whiche the firſt manne taketh, did ſate into the ſtocke $\frac{640}{1}$. How muche ſhall the $\frac{3}{8}$ of the gaine ſate in, whiche is the ſeconde mannes gaine? Multiplie and diuide, and you ſhall finde 384. pounde, ſo muche ought the ſeconde man to ſate into companie.

3. Twoo Marchauntes haue companied together, the firſt manne laied in. 640. pounde, and the ſeconde hath

laied in ſo muche, that he muſte haue 60. pounde for his part of. 100. pounde whiche thei haue gained. I demaunde howe muche the ſeconde man did laie into companie? Anſwere: ſeyng that the ſeconde man taketh. 60. pounde of the gaine: it followeth that the firſte muſt haue but. 40. pounde. Therfore ſaie by the rule of. 3. if. 40. pounde doe laie in. 6 40. pounde, what ſhall. 60. pounde laie in? Multiplie and diuide, and you ſhall finde. 260. li. ſo muche did the ſeconde Marchaunt laie in.

4. Two Marchauntes haue companied together, the firſte laied in. 83. pounde, 6. ſhillinges. 8: pence, the ſeconde put in. 170. duckettes: and thei haue gained 100. li of ꝟ which the firſt man muſt haue 60 pounde. I demaũd what the ducket was worth? Anſwer ſeyng that the firſt man muſt haue 60 pounde, it followeth that the ſeconde muſte haue. 40. pounde, therefore ſaie by the rule of three, if. 60. pounde of gaine that the firſt man taketh did lay

in

in.83.li.6 s.8.pence of pꝛincipall, how muche shall.40.li.of gain put it, multiplie and diuide, and you shall finde 55. li.$\frac{1}{9}$: so muche are the 170. duckets woꝛth. Then put 55.li.$\frac{1}{9}$ into shillings and you shall haue 1111.s.$\frac{1}{9}$ then to knowe what the ducket is woꝛth, saie by the rule of thꝛee, if a $\frac{1}{170}$; giue 1111. $\frac{1}{30}$ what will $\frac{1}{1}$ giue? Multiplie and deuide, and you shall finde 6.s.6.d.$\frac{33}{51}$, so muche is the ducket woꝛth.

5. Two Marchauntes haue companied together, the second man laied in moꝛe by 30. poundes then did the firste man: and they gained 120. poundes of the whiche the firste man ought to haue 50. pounds. I demaund what eche of thē did laie in. Aunsware, from 120. pound abate 50. pounde and ther resteth 70. pound foꝛ the second mans parte: so that by thys meanes the secounde manne (becaule he laide in 30. pound moꝛe then the firſt man did) taketh 20.l. moꝛe of the gain: ẽ therfoꝛe say by the rule of 3. if 20.li. of gaine

did

did laie in. 30. pounde of principall, how muche shall. 50. pounde laie in? Multiplie and diuide, and you shall finde. 75. pounde, so muche did the first man laie in, and consequently the seconde laied in. 105. pounde.

6. Twoo Marchauntes haue companied together, the second hath laied in twise so muche as the first man did, and. 10. pounde moze: and thei gained 100. pounde, of the whiche, the first ought to haue. 32. pounde for his part: I demaunde how muche eche of them did laie into companie? Answere, If it were not for the. 10. pound that the seconde manne laied in moze: he should haue had but. 64. pounde of the gaine, which is the double of the first mānes parte. But because he laied in. 10. li. moze, he hath lower pounde moze of the gaine, and therfore laie by the rule of. 3. if. 4. pound of gaine did laie in 10 pound of principall (whiche was ouer and aboue the double of the first mannes laiyng in) what shall. 32. li. of gai-

nes

nes laie in: whiche is the firſt mannes part of the gaines that he taketh. Multiplie and diuide, and you ſhall finde 80. li. for the firſte mannes laiyng in: and conſequently 170. pounde for the ſecond mannes portion that he laid in.

4. Two Marchauntes haue companied together, and thei haue gained 100. pound of the which the firſt muſt haue after the rate of 10 vpon the 100 pound, and the ſecond muſt haue after the rate of 15 pound vpon the 100. li. I demaunde howe muche eche of theim ought to haue? Anſwere. That 10. li. for the firſt mannes laiyng in, and. 15 li. for the ſecond mannes laiyng in: Rode 10. li. and. 15. pound together, and thei make 25. pound. Then put 10. ouer 25 and it is $\frac{10}{25}$, whiche beyng abreuiated are $\frac{2}{5}$. Therefore he that taketh 10 li. vpon the 100. li. muſt haue the $\frac{2}{5}$ of the gaine, whiche is 40. li. Then put. 15. ouer 25. and it is $\frac{15}{25}$, which being abreuiated are $\frac{3}{5}$. Therfore the ſecond muſt haue $\frac{3}{5}$ of the 100. li. which is. 60. li.

8. Two

8. Twoo Marchantes haue companied together, the first laied in 46. li. 18. shilling. and the seconde laied in 33. pounde 2. s. so thei haue gained 30. pound. I demaunde how much euerie man shal haue for his part of the gain Answere: Adde 46. pound 18. shilling and 33. pound 2. shilling both together and you shall finde 80. pound for your common diuisor: then saie if 80. pound which is all their stocke do gain 30. li. what wil 46. $\frac{9}{10}$ gaine, whiche is the firste mans laiyng in: Multiplie and deuide, and you shall finde 17. pounde 11. shillyng 9. peuce for the firste mans part of the gaine. Then saie again, if 80. pound do gain 30. pound what wil 33. pound $\frac{1}{10}$ gain, whiche was the seconde mans laiyng in: multiplie & deuide, and you shall finde 12. li. 8. s. 3. d. for the seconde mans part of the gain.

And after the same maner shal you doe, in case there were three or foure Marchauntes that wouide companie together; Adoyng al their summes of money

money (which thei lay into the ſtocke) into one totall ſumme: whiche ſhalbe your common deuiſor: and then worke with the reſte, as is taught in the former queſtions of the rule of company.

9. Three Marchantes haue companied together, the firſt laide in I know not how muche: the ſeconde did put in 20. peeces of clothe, and the thirde hath laide 500. pounde. So at the ende of their companie, their gaines amounted vnto a thouſande pounde, wherof the firſte manne ought to haue 350. pounde, and the ſeconde muſte haue foure hundred pounde.

Now I demaunde how muche the firſt man did laye in, and for how muche the twentie peeces of clothe were put into companie?

Anſwere.

Seeyng that the fyrſte and the ſeconde Marchantes muſt haue 750. li. for their partes of the gain. Then the thirde manne muſte haue the reſte of the thouſande pound which is 250. li.

And

And therefore sate by the rule of. 3. & 250. of gaine, be come of 500. pound of pzincipall: of how muche shall come 350 pounde of gaine? whiche the firste man taketh, multiplie and diuide, and you shall finde 700. pound. So muche did the first mã late in: then sate if. 250. pound of gaine be come of. 500. pound of pzincipall, of how muche will come 400. pounde, whiche is the gain that the second man taketh. Multiplie and diuide, and you shal finde. 800. pound For so muche were the. 20. peeces of clothe lated into companie.

10. Three Marchauntes haue gained. 100. li. the firste must haue the $\frac{1}{2}$, the seconde must haue $\frac{1}{3}$: and the third must haue $\frac{1}{4}$. I demaunde how muche euery manne must haue of the gaine? Answere: reduce $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$, into a commõ denomination, after the order of the second reduction in fractions, and you shall finde $\frac{12}{24}$, for the $\frac{1}{2}$, $\frac{8}{24}$, for the $\frac{1}{3}$: and $\frac{6}{24}$, for the $\frac{1}{4}$: Then take twelue for the firste mannes laying in, 8. for the se-

conde

cond mannes laying in: and 6 for the thirde mannes laying in. The whiche three nombers beinge added together shall be your common diuisor, whiche do make 25. Then multiply 100 by 12 for the firste man, by 8, for the second man, and by 6 for the third man. And diuide euery multiplication by 26. So shall you fynde 46 li. $\frac{2}{13}$ for the fyrste mannes part of the gaine. 30. li. $\frac{10}{13}$ for the second mannes parte: and 23 li. $\frac{1}{13}$ for the third mannes parte.

II. Two marchauntes haue gained 100 li. the firste muste haue $\frac{1}{3}$ and 5 li. more: the second must haue $\frac{1}{3}$ and 4 li. more: I demaunde howe muche eche of them shall haue? Aunswere, From 100 abate 5 and 4. so ther wil remain 91. then take the $\frac{1}{3}$ of 100 l. which is 50 li. for the firste mans laying in: Likewise, take $\frac{1}{3}$ of 100 li. for the seconde mans laying in, which is 33 li. $\frac{1}{3}$. Then adde 50 li. and 33 li. $\frac{1}{3}$ togither, and you shall haue 83 li. $\frac{1}{3}$ for youre com-

mon diuiſor, then multiply 91. pound by 50. and diuide by 83. $\frac{1}{3}$: and thereof cõmeth 54 pound, $\frac{1}{7}$ vnto the whiche nomber adde 5, and all is 59. li. $\frac{1}{7}$ for ỹ firſt mans part. Likewiſe multipiye. 91. by 33. $\frac{1}{3}$: and diuide by 83. $\frac{1}{3}$: and you ſhal finde 35 li. $\frac{1}{7}$ vnto the which adde 4: and you ſhal haue fourty pound, $\frac{2}{7}$ for the ſeconde mans part.

12. Two Marchauntes haue gayned a hundred pound, the firſte muſte haue the $\frac{1}{3}$ leſſe by 4 pound, the ſecond muſt haue $\frac{1}{3}$: leſſe by 2 pounde. I demaund how much eche of them ſhall haue? Anſwere, Adde 4 & 2. with 100. & they make 106. Thẽ take as before is ſaide 50 pounde, for the firſt man, & 33. $\frac{1}{3}$ for the ſeconde, adde them bothe together, & they be 83. $\frac{1}{3}$ whiche ſhalbe your diuiſor. Then multiplie 106. by 50. and diuide the product by 83 $\frac{1}{3}$, ſo thereof commeth 63. li. $\frac{3}{7}$. From the whiche abate the foure pounde leſſe ỹ the fyrſte mã taketh, and then is there remaining 59. pounde, $\frac{3}{7}$ for his parte.

Like-

Likewise multiplie 106 by 33. $\frac{1}{3}$ and diuide by 83 $\frac{1}{3}$ & you shall finde 42. li. $\frac{2}{3}$: from the which abate 2. li. lesse and there remaineth 40. pounde, $\frac{2}{3}$ for the seconde mans part.

¶ The rule of Felowship with time.

The money that euery mã layeth in, muste be multiplied by the time that it remaineth in company: and of that whiche cõmeth thereof you shall make their newe layings in for eche of them: and then multiplye the gaines by euery one of them seuerally, the whiche you shall diuide by all their new layings in adding togither, and you shall haue proportionally eche mannes parte of the gaine according to his laying in.

¶ *Example.*

1. Two Marchauntes haue companied togither, the first hath put in the fyrst of January 450. pounde, the second did lay in ye 2. of May. 750. pound

S.y. And

And at the yeres ende, they had gayned 100 li. I demaunde howe muche eche of them ſhall haue of the gayne: Anſwere: foraſmuche as the firſte did put 450. li. the fyrſte of Januarye: his money remained in company 12. monethes, and therefore multiply 450. by 12 monethes, and therof commeth 5400. for his newe laying in. And the ſeconde layed in his 750 li. but at the firſt daye of Maye: ſo that his money remained in companye but 8 monethes. Therefore multiplye his 750 li. by 8. and therof commeth 6000 for his new laying in: Thē adde 5400. with 6000. and they make 11400 for your common diuiſor: Then multiply 100 li. which is the gaynes by 5400, and diuide the product by 11400. and therof commeth 48 li. $\frac{7}{19}$ for the firſt mannes part of the gayne. Likewiſe multiplye 100. by 6000, and diuide the product by 11400, and you ſhal finde 52. $\frac{11}{19}$ and ſo muche muſt the ſecond man haue for his parte of the gayne.

2. Two

2. Two marchaunts haue compa-nied togither, the first hath put in the first of January 640. li. The seconde can lay in nothing vntil the first of Aprill. I demaunde how much he shall then laye in, to the ende that he maye take halfe the gaines? Answere, Mul tiply 640 li. by 12. monethes that his money abideth in the companye, and therof cõmeth 7680 li. for his layinge in. And so muche oughte the seconde mannes layinge in to be, for because he taketh ½ of the gaine: But for that, that he putteth in nothinge vntill the first of Aprill, his money can be in cõ-pany no lõger than 9 monethes. And therefore diuide 8680 by 9, and therof commeth 753 li. ⅓. So much oughte the seconde marchaunt to laye in the first of Aprill, to the ende that he maye take the one moyty of the gaynes.

3. Three Marchauntes haue com-panied togither. the first layed in the first of Marche 100 li. The se-

conde laide in ỹ firſt of June ſo muche money, that of the gaine, he muſte haue the $\frac{1}{3}$ parte: and the thirde laide in ỹ firſt of Nouember ſo muche money, that of the gaines he muſte haue likewiſe $\frac{1}{3}$: and thei continued in company, vntil ỹ nert Marche folowing. I demaunde howe muche the ſeconde and the thirde Marchauntes did laye in? Anſwere, Multiply 100. which the firſte man did lay in, by 12. monethes that his money continued in companie, and therof commeth 1200. for his laying in: and ſo muche ought the ſeconde and the thirde marchaunt eche of them to lay in: Becauſe they parte the gaynes by thirdes. But for that, that the ſeconde Marchaunt putteth in nothinge tyll the firſt of June, hys money can bee in companye but nine monethes. Therefore diuide 1200. by nine monethes, and therof commeth 133. $\frac{1}{3}$. And ſo muche ought the ſeconde Marchaunt to laye in: Then, foraſmuch as the thirde Marchaunt, dyd

laye

laye in nothing vntil the firſt of November: His money abideth in companye but the ſpace of foure monethes. Therefore diuide 1200. by 4. and thereof commeth three hundred pounde. And ſo much ought the thirde marchaunt to lay into companye.

4. Three Marchauntes haue companied togither, the fyrſte layde in the fyrſt of Ianuary a hundred Ducketes. The ſeconde hath layed in fyftye pounde, the fyrſte of March: And the thirde putte in a Jewell the fyrſte of Julye: And at the yeares ende, they had gained foure hundred crownes: of the whiche, the fyrſte marchaunt muſt haue fifty crownes, and the ſeconde muſte haue 80. I demaunde what the Ducket was worth and at what price the Jewell was valued, whiche the thirde Marchaunte layde in?

Anſ.

Aunſwere: the firſte mannes money is 1200 as afore is ſayde, and he taketh 50 crownes of the gayne: therefore ſay, if fifty crownes of gayne be come of 1200, whiche was his ſtock, of how much ſhall come 80. crownes of gaine that the ſeconde man taketh: multiplye and diuide, and you ſhall finde 1920. for the ſecond marchaunts laying in. Then ſay again, if 50 crownes be come of 1200. ſtocke: of howe much ſhal come 270. crownes, which the thirde man taketh of the gayne? Multiply and diuide, & you ſhall finde 6480. for the third marchauntes laying in. Then diuide 1920, whiche is the ſeconde mannes laying in, by 10. monethes that his money did continue in company, and you ſhall fynde 192 Duckets, which are worth 50. li. becauſe he layed in 50 li. Then diuide 192 Duckets by the ſayde 50, li. (being reduced into ſhillinges) and there of commeth 5. ſhillings 2. pence, $\frac{1}{3}$. ſo muche was the Ducket worth: Finally,

nallye, diuide 6480. (whiche is the third mannes layinge in) by 6. monethes that his Jewel remained in companye, and you ſhall finde 1080 Duckets: and for that price was ỹ Jewell put in company.

5. Three Marchauntes haue companied togither: the firſt layed in the firſt of January 100 li. and the firſte of Aprill he hath taken backe againe 20. li. The ſecond hath layed in the firſte of Marche 60 li. and afterward he dyd put in more 100 li. the firſt of Auguſt. The third layd in the firſt of July 150. li. And the firſt of October he did take backe againe 50 li. And at the yeres end, they found that they had gained 160 li. I demaunde how muche euery man ſhall haue? Aunſwere, Multiply 100 li. which the firſt man layed, by 12 monethes, and thereof commeth 1200. li from that nomber abate 9 times 20 which are 180. and there wil remaine 1020, for the firſt mans laying in. The multi-

multiplie 60. which the ſeconde man layde in, by ten & you ſhalt haue 600. vnto the which adde 5. times one hundred, which are 500. ſo all amounteth to 1100. for the ſecond mans laying in Afterwardes, multiplie 150. pounde, which the thyrde man hath layed in, by 6. monethes, and therof commeth 900. from the which nōber abate three times 50. and they are 150: ſo there reſteth 750. for the thyrde mans laying in. Then proceede wyth the reſte, as in the firſte Queſtion of the rule of fellowſhip with tyme, in adding 1020, 1100. and 750. altogither, whiche ſhall be your Diuiſor: Then multiplie 160 by 1020. by 1100. and by 750. & diuide at euery time by your Diuiſor, which is by all theyr layinges in added togither, and they make 2870, ſo you ſhal fynde 56. $\frac{241}{287}$: for the fyrſte man, 61. $\frac{93}{287}$ for the ſeconde, and 41. $\frac{233}{287}$ for the thirde man.

6. Two Marchaunts haue compa-

nied

nied togither, the fyrſte hath put in 960. pounde, for the ſpace of 12. monethes, and he ought to haue 8. pounde vpon the hundred pound of the gaine. The ſecond hath layed in 1120. li. for the ſpace of eight monthes, & he ought to haue after 12. pounde vpon the 100. pound of the gaine.

And at the yeares ende, they haue gained eyght hundred pounde. I demaunde how much eche of them ſhall haue of the gaine. Anſwere, multiplie 960. that the firſt mã did lay in, by 12. monethes, and the product thereof, multiplie againe by 8. and you ſhall haue 62160. for the fyrſt mans laying in: then multiplye the 1120. that the ſeconde hath layed in by eyght monethes, and that whiche commeth thereof you ſhall multiplie againe by 12. and you ſhal finde 107520. for the ſeconde mans layinge in, then proceede with the reſt, as in the firſt Queſtion of the Rule of Felowſhippe, and as in the laſte Exaumple, and you ſhall finde

finde 399 $\frac{3}{11}$ for the first man: and 430. li. $\frac{10}{11}$ for the second man.

¶The rule of company, betwene Marchauntes and their Factours.

7. The estimation of the bodye or persone of a Factour, is in suche proportion to the stocke, whiche the Marchaunt layeth in: as the gaine of the sayd Factour is vnto the gayne of the sayd Marchaunt. As thus: if a Marchaunt do put into the handes of hys Factour 200 li. to employe, and he to haue halfe the profite, the persone of the sayd Factour shal be esteemed 200 li. And if the Factour do take but the $\frac{1}{3}$ of the gaine, he shoulde haue but $\frac{1}{3}$ so much of the gaine as the marchaunt taketh, which should take $\frac{2}{3}$ wherfore the persone of the Factour is esteemed but the $\frac{1}{3}$ of that which the Marchaunt layeth in, that is to say 100 li.

And if the Factour did take the $\frac{2}{3}$ of the

the gaine, then the Marchaunt ſhall take the reſidue, which are $\frac{2}{3}$ of $\frac{1}{2}$ gaine wherefore the gayne of the Mayſter vnto that of the Factoure is in ſuche proporcion as 3 vnto 2. Then if you will knowe the eſtimation of the perſone of the Factour, ſay if 3 giue me 2 what will 200 giue? Multiply 200 by 2 and diuide be 3 ſo you ſhall finde $133\frac{1}{3}$ Otherwiſe, conſider that the Factour taketh the $\frac{1}{2}$ of that whiche the Marchaunte taketh. And therfore take the $\frac{2}{3}$ of 200, and you ſhall fynde $133.\frac{1}{3}$ as before: and ſo muche is the perſone of the Factoure eſteemed to bee worthe.

8. And if the Marchaunt ſhould deliuer vnto his Factoure 200. li. and the Factour woulo laye in 40. li. and his perſon, to the ende he might haue the halfe of the gaine: I demaund for how much ſhall his perſon be eſteemed Anſ. abate 40 li. from 200 li. and ther will remaine 160. li. And at ſo much ſhall

shall his person be esteemed.

And if the factour would take the $\frac{2}{3}$ of the gaine, his person with his 40 pounde, shall bee esteemed twise as muche as the stock that the marchant layeth in, which shoulde haue but $\frac{1}{3}$ of the gaine: for $\frac{2}{3}$ vnto $\frac{1}{3}$, is in double proporcion. Therefore double twoo hundred pounde, therof cōmeth 400. li. from the which abate 40. li. & there will remaine 360. li. And if the Factour would take but the $\frac{1}{3}$ of the gaine, that shall bee but the $\frac{1}{2}$ of $\frac{2}{3}$ whiche the marchaunt taketh: then the estimacion of his person, with his layinge in shoulde be esteemed but the halfe of the whiche the marchaunt layeth in: take therfore the $\frac{1}{2}$ of 200. li. whiche is 100. li. from the which abate fourty pounde and the rest whiche is 60. li. is the estimation of his person.

9. If it so chaunce that for to make traffick of 240. li. ỳ person of the factour should be so esteemed, ỳ he shoulde haue

haue but the $\frac{1}{4}$ of the gaine, and yet he would haue the $\frac{1}{3}$, I demaunde howe much he shoulde put in of readye money, besides his person? Answere, seing that his person gaineth the $\frac{1}{4}$, all the whole layinge in, shall gaine the rest that is to saye the $\frac{3}{4}$: nowe forbycause $\frac{1}{4}$ is the $\frac{1}{3}$ of $\frac{3}{4}$ therefore his person shalbe esteemed the $\frac{1}{3}$ of all the layinge in. Take then the $\frac{1}{3}$ of 240. and you shall haue 80. for the estimation of his person, and for that, that he wyll haue the halfe of the gaine, you shal adde 80. with 240. li. and therof commeth 320. of the which take the halfe, which is 160. and from the same you shal abate the 80. and there wyll remaine other 80. which he ought to lay in of readye money, and the marchaunt muste lay in the ouerplus, whiche amounteth to 160. li.

10. A marchaunt hath delyuered to his Factour 1200. li. to gouerne them in the trade of Marchandise vpon such condition that hee for hys seruyce

shall

shall haue the ⅓ of ỹ gaine if any thing be gayned, or of the losse if any thing be lost: I demaund for how much hys person was esteemed? Answere, seeing that the Factoure taketh the ⅓ of the gaine, hys persone ought to bee esteemed as muche as ⅓ of the stock whiche the Marchaunte layeth in, that is to say ỹ ⅓ of 1200 li. which is 900 l. The reason is, bycause the ⅓ of the gayne that the Factoure taketh, is the ⅓ of the ⅔ of the gaine that the Marchaunt taketh.

II. A Marchaunt that deliuereth vnto his Factour 1200 li. and ỹ Factour layeth in 500 li. and his person: Now, bycause he layeth in 500 li. and his persone, it is agreed betweene them that he shal take the ⅖ of ỹ gain: I demaũde for how much his persone was esteemed? Aunswere, Forasmuche as the Factour taketh the ⅓ of the gaine, he taketh the ⅓ of that which ỹ Marchãt taketh, for ⅓ are the ⅔ of ½: and therefore

foꝛe the Factours laiyng in ought to be 800. pound, which is the $\frac{2}{3}$ of 1200. pounde, that the marchaunt laied in: Then abate 500. pounde, whiche the Factour did lay in, from 800. pounde, whiche should be his whole stock and there remaineth thꝛée hundꝛed pounds foꝛ the estimation of his persone.

12. Moꝛe, a marchaunt hath deliuered vnto hys factoure a thousande pounde vpon suche condition, that the factour foꝛ his paines and seruice, shal haue the gaines of 2. hundꝛed pound, as though he had laide so muche in of redy money: I demand what the poꝛtion of the gaine, the saide Factour shall take? Aunswere: Séé what parte the two hundꝛeth pounde (whiche the Factour layed in) is of one thousande twoo hundꝛeth whiche is the whole stocke of their companie, and you shal finde that it is the $\frac{1}{6}$, and such parte of the gaine shall the Factour take.

But in case that in making the conenauntes, it were agreed that the

Factour should haue the gaine of fiue hundred pounde of the stocke, whiche the marchaunte layeth in, that is to saie of the thousande pounde. Then shoulde the Factour take the $\frac{1}{5}$ part of the gaine. For twoo hundred pounde is the $\frac{1}{5}$ of a thousande pounde.

¶The 11 Chapiter treatteh of the Rules of barter.

TWo Marchaunts will chaūge their marchandise, the one with the other. The one of them hath clothe of 7.s.1.d. the yarde to selle for readie money, but in barter he will sel it for 8.s.4.d. The other hath Synamon of 4.s.7.d. the li. to sell for readie money. I demaunde how he shall sell it in barter to the ende he be no loser? Aunswere, saie, if 7. $\frac{1}{12}$ (whiche is the price that the yarde of clothe is worth in readie money (be solde in barter for 8. $\frac{1}{3}$ for what shal 4. $\frac{7}{12}$ be solde in barter which 4. $\frac{7}{12}$ is the price that the l. of Synamon is worth in readie money, reduce the whole numbers in to their broken,

broken, and then multiply and diuide, and you shall finde 5.s.4.d.$\frac{12}{17}$ parts, of a penie, and for so much shall he sell the pounde of Synamon in barter.

2. Two Marchaunts will chaunge their marchaundise the one with the other, the one of them hath Chamlets of two pounde 18.s.4.pence the peece to sell for ready money, and in barter he will sell the peece for 4.li.3.s.4.d. the other hath fine cappes of 35.s.10.d. the dossen to sell in barter. I demaund what the dosen of caps did cost in redy money? Answere: saie if 4.li.3.s.4.d. whiche is the ouerprice of the peece of Chamlet, become of 2.li.18.s.4.pence whiche was the iust price of the same, of what shal come 35.s.10.d. whiche is the ouerprice of the dossen of cappes: Multiplie and deuide, and you shall finde 25.shil.1.d. and so muche are the dossen of caps worthe in redie money.

3. Two Marchants will chaunge their marchaundise the one with the other: the one of them hath Fustians

of 18.s.4.d.the peece to ſell for readye money,and in barter hee will ſell the peece for 26.s.8.pence.The other hath tapiſtrie of 15.d.the ell to ſel for readie money,and in barter he will ſell it for 20.pence the ell:I demaunde whiche of them gaineth, and howe muche vpon the hundred pounde of money?

Aunſwere:ſaye if 18.s.$\frac{1}{3}$(which is the iuſte price of the peece of Fuſtian)bee ſolde in barter for 16.s.$\frac{3}{4}$: for howe muche ſhall 1.s.$\frac{1}{4}$(whiche is the iuſte price of the ell of Tapiſtry)be ſolde in barter:Multiplie and diuide, and you ſhall finde 21.d.$\frac{3}{11}$.And he doeth ouerſel it but for 20.d.ſo that of 21.d.$\frac{3}{11}$:hée maketh but 20.d.And therefore ſaye by the rule of three, yf the ſeconde marchaunte,of 21 $\frac{3}{11}$,do make but $\frac{20}{1}$ howe muche ſhall he loſe vpon the $\frac{100}{1}$? Multiplie and deuide, and you ſhall find 21.$\frac{3}{4}$,the which being abated from a hundred there wil remaine 8.$\frac{1}{4}$.And after the rate of 8.$\frac{1}{4}$.doeth the ſeconde marchant loſe vpon the 100.And conſequentlie,

sequently the firste marchant, of 20.li. maketh 21.li.$\frac{9}{11}$: and therfore say again by the rule of thre, if the first marchãt of $\frac{10}{11}$, doe make 21.$\frac{9}{11}$ how much shall he gaine vpon $\frac{100}{1}$? Multiplie and diuide, and you shall finde 102.li.$\frac{1}{11}$. Thus the firste gaineth after the rate of nine pounde.$\frac{1}{11}$ vpon the hundred pounde of money.

For your better vnderstanding of these questions, you muste note that when one Marchaunte gaineth of an other after the rate of ten pound vpon the hundred pounde hee gaineth the $\frac{1}{10}$ of his owne principall, and the other whiche loseth after the rate of 9.$\frac{1}{11}$ vpon the hundred he loseth the$\frac{1}{11}$ of his principal. And it may be proued thus: When one marchaunt will sell hys wares vnto an other, whiche wares stand him but in 100.li. and he wil sel thẽ for 110.li. he of his 100.li. maketh 110.li. wherfore he gaineth after 10.li vpon the 100. whiche is the $\frac{1}{10}$ of his principall, and the other whiche byeth

wares for 110.li. that coſte but 110.li. of the 110. poũd he maketh but 100.li. And therefore ſay by the rule of three, if 110. become of 100. of howe muche ſhall come 100? Multiplie and deuide, and you ſhall finde 90.$\frac{10}{11}$, the whiche abate from 100: and there reſteth 9.$\frac{1}{11}$ whiche is the $\frac{1}{11}$ of his principall that ỹ ſecond loſeth vpon the 100. as afore is ſaied. And therefore, who ſo that will know what one marchant gaineth of another, either after the rate of tenne vpon the hundred, whiche is the $\frac{1}{11}$ of hys principall, or elſe after the rate of twentie vpon the hundred which is the $\frac{1}{7}$, or of anye other parte, and that he would likewiſe knowe what parte the other loſeth of his principall: hee muſte take for the numeratour of the broken number of hym that loſeth, as much as for him that gaineth, then adde the numerator and the denominator (of the broken number of hym that gaineth) both togither, and make therof the denominator of the broken

num-

number of hym that loſeth, and then ſhall you haue the parte of hym that loſeth, as by example, of him that gaineth after ten pound vpon the 100. li. which is the $\frac{1}{11}$ of his principall: take the numerator which is 1. and make that the numeratoure of the broken number of hym that loſeth, then adde 1. whiche is the numerator of the fraction of hym that gaineth with tenne, whiche is his denominator, and you ſhall haue 11. for the denominateur of the fraction of hym that loſeth. Then put one ouer the 11. and you ſhal haue $\frac{1}{11}$. Thus it appeareth when one marchaunt gaineth of an other after ten vpon the hundred, he gaineth the $\frac{1}{10}$ of his principall, and the other loſeth 9. $\frac{1}{11}$ whiche is the $\frac{1}{11}$ of hys principall. And if he woulde gaine after twentie vppon the hundred whiche is the $\frac{1}{5}$ of hys principall, the other ſhoulde loſe fiftine $\frac{2}{5}$ whiche is the $\frac{1}{2}$ of hys principall, and ſo is to bee vnderſtande of al other fractions.

4. Two marchaunts wil chaunge their marchaundise the one with the other, the one of them hath Sayes of 20.s.& 10.d. the peece, to sel for readie monye, and in barter he will sell the peece for 23.s.4 d. and yet he wil gain moreouer after ten pounde vppon the hundred pounde. The other hath wol of 50.s. the hundred to sell for readye money. I demaunde how he shall sell the C. of woll in barter? Answere: say if 20.s.10.d. whiche is the iuste price of the peece of Saye, be solde in barter for 23.s.4.d. for how much shall 50.s. (which is the iust price of ℔ C. of woll) be solde in barter? Multiplye & diuide, and you shal finde 56.s. Then for because the first marchant gaineth after 10.li. vpō the C.li. he maketh of his c. li. 110.li. and consequently the second marchant maketh of 110.li. but 100.l. And therefore sale, if the seconde marchaunt of 110. doe make but 100 how much shal he mak of 56: Multiply and diuide & you shal finde 50.s.20.d. $\frac{10}{11}$ of a peny.

a penie, and for ſo muche ſhall he ſelle the hundred of woll in barter.

5. More, two Marchauntes wyll chaunge their marchaundiſe, the one with the other, the one of theim hath Taffeta, of 16 crownes the peece to ſell for readie money, and in barter he will ſel the peece for twenty crownes, and yet he wyll gaine moreouer after ten pounde, vpon the hundred pound. The other hath ginger of 3.s 9.d. the pounde waight, to ſell in barter. I demaunde what the pounde did coſte in readie moneye? Anſwere: ſaye if twenty crownes which is the ſurprice of the peece of Taffeta, become of 16. crownes the iuſte price, of how muche ſhall come 3.s.9.d. whiche is the price of the ouerſelling the pounde of Ginger? Multiply and diuide and you ſhal finde 3.s. Then, for becauſe that the Marchaunt of Taffeta will gaine after the rate of ten vppon the hundred: ſay if 100. doe giue 100. what ſhal 3.s. giue? Multiplie and deuide and you

ſhall finde thre ſhillinges thre pence $\frac{3}{7}$ and ſo much did the pound of Ginger coſte in readie money.

6. Yoe twoo marchauntes will chaunge their marchaundiſe the one with the other, the one of theim hath Woſſeds of 25 ſhil. the peece to ſel foꝛ ready money, and in barter he wil ſell the peece foꝛ 33. ſhill. 4. pence and yet he loſeth after ten vpon the hundꝛed: the other hath ware of 3 pound 6. ſhil. 8. pence the hundꝛed to ſell foꝛ readye money. I would know how he ſhould ſell his ware in barter? Aunſwere: ſay if 25. ſhil. whiche is the iuſte pꝛice of the peece of Woſſeds be ſolde in barter foꝛ thꝛee and thirtie ſhill. 4. pence, foꝛ how much ſhall thꝛe pound 6. ſhil. 8. d. be ſolde, whiche is the iuſt pꝛice of the hundꝛed of ware. Multiply and diuide, and you ſhall finde foure poond $\frac{4}{9}$ whiche is eight ſhillinges ten pence, $\frac{2}{3}$ then foꝛ becauſe that the Marchaunt of Woſſeds, loſeth after ten vppon the hundꝛed: Of a hundꝛed he maketh

but

but ſixtie. And therefore, ſaie: If ninetie gene a hundred what gineth foure pounde. $\frac{4}{5}$: Multiply and diuide, and you ſhall finde foure $\frac{76}{81}$ whiche is worth eightine ſhillinges nine pence $\frac{5}{27}$, and for ſo much ſhall he ſell the one hundreth of Ware in barter.

7, More, twoo Marchauntes wyll chaunge their marchaundiſe the one with the other, the one of them hath Worſteds of 5. pounde ſix ſhillinges, eight pence the peece to ſell for readie moneye, and in barter he will ſell the peece for 6. pounde, 13. ſhillinges. 4. d. and yet he loſeth after tenne vpon the hundred, and the other hath Muſke of two ſhillings. nine pence $\frac{1}{7}$ the pound waight, to ſell in barter: I demaunde what the pound did coſt in readie money? Anſwere: ſay it 6 pound. $\frac{3}{5}$ whiche is the ouerprice of the peece of Worſted, become of 5. pound, $\frac{1}{9}$ whiche is the iuſt price of the ſame, of how much ſhall come twoo ſhillinges 9. pence. $\frac{1}{7}$.

Multi-

Multiplye and deuide and you ſhall finde 2.$\frac{2}{9}$. whiche is twoo pence $\frac{2}{3}$ then for becauſe that the marchaunte of Worſteds loſeth after tenne vpon the hundred, of a hundred he maketh but 90. and therfore ſate if a hundred giue but 90. how muche ſhall 2.s.$\frac{2}{9}$ giue? Multiply and diuide and you ſhal find twoo ſhillynges and ſo muche coſte the pound of Ruſke in readie money.

Other Rules of Barter, wherein *is giuen ſome parte in readie money.*

When a Marchaunt ouerſeleth hys marchaundiſe and he will giue alſo ſome part of hys ouerprice in readie money as in the $\frac{1}{2}$ the $\frac{1}{3}$ or the $\frac{1}{4}$ &c. He muſt ſubſtract the ſame part of money from the iuſte price, and alſo from the ouerprice of his marchandiſe: and the two numbers that remaine after the ſubſtraction is made, ſhalbe that twoo firſte numbers in the rule of three and the iuſte price of the ſecond marchant ſhalbe

ſhalbe ⅓ thirde, to knowe howe much he ſhal ouerſel the part of his marchādiſe

8: Two Marchaunts will chaunge their marchaundiſe the one with the other the one of theim hath fine woll at fiue pounde the hundzeth, to ſell foz readie moneye, and in barter hee will ſell it foz fire pounde, and yet hee will haue the ⅓ in readye money. The other hath clothe of 13. ſhillinges four pence to ſel foz ready money. I would knowe howe he ſhall ſell the ſame in barter: Aunſwere: take the ⅓ of 6.li. whiche is the ouerpzice of the 100. of wolle, and you ſhall haue 2. pound the whiche abate from 5.li. whiche is the iuſt pzice of the 100. of woll and from 6.li. which is the ouerpzice, and there ſhal reſt 3.l. and 4.l. foz the 2 firſt numbers in the rule of thzee, then take 13.s. 4.d. whiche is the iuſt pzice of a yarde of clothe foz the thirde number: Then multiplie and deuide and you ſhall finde 17. ſhill. 9.d. ⅓. foz ſo muche ſhall the ſeconde ſelle his clothe in barter.

9. Noze

9. Yaye, two Marchauntes will chaunge their marchaundise the one with the other, the one of them hath waxe of three pound. 6. s. 8. d the C. to sell for readie money, and in barter he will sell the same for 4. li. 3. s. 4. d. and yet he will haue the $\frac{1}{4}$ in ready money, and the other hath fine Crimson sattine of 15. s. the yarde to sell in barter. I demaund what it is worth in ready money. Aunswere. Take the $\frac{1}{4}$ of 4. li. 3. s. 4. d. and abate it from 4. li. 3. s. 4. d. and from three pounde 6. s. 8. pences, and there resteth 3. li. 2. s. 6. d. and 2. li. 5. shillinges 10. pence for the two first numbers in the rule of three, and 15. s for the thirde number whiche is the ouerprice of the yard of sattine. Then multiply and diuide, and you shal find 11. shillinges. And soe muche did the yarde of sattine cost in readie money.

10. Two Marchants will chaunge their marchandise the one with the other, the one of them hath tinne of 50. shillings the hundred to sell for ready

mo-

money, and in barter he wil ſell it for three pounde 6.s.8.d and he wil gaine after ten vppon the hundred, and yet he wil haue the one half in readie money: and the other hath leade of 3. halfpence the li. to ſell for readie money. I demaund how he ſhall ſell the pounde in barter? Anſwere: See firſt at tenne vpon the hundred, what the three poũd $\frac{2}{3}$ will come vnto, and you ſhall finde that they will come to 3.li.$\frac{2}{3}$, which is 13.s.4.d. of the which, the halfe which he demaundeth in readie money, is 36 ſhillinges and 8. pence the whiche beyng abated from fiftie ſhillinges, and alſo from three pounde 13. ſhillinges four pence, there ſhal reſt 13. ſhillings foure pence, and one pound ſixtine. s. eight pence, for the two firſt numbers in the rule of three, whiche you muſte put al into halfepence, and the halfepence for the thirde number, and then multiplye and diuide, and you ſhall finde 4. pence $\frac{1}{2}$, and for ſo muche ſhall hee ſell the pounde of leade in barter.

II. Pay-

11. More twoo marchauntes will chaunge their marchaundise the one with the other, the one of theim hath steele of 16.s.8.d.the hundred waight to sell for readie money, and in barter he wil sell it for 25.s.and yet he loseth after tenne vpon the hundred, but hee will haue the $\frac{1}{2}$ in readie moneye, the other hath yron of 6.shill.8.pence the dundred to sell in barter, I demaunde what it did coste in readye money?

Aunswere: saie if a hundred come but to 90.how muche shall 25.s.come to? Multiplie and deuide, and you shall finde 22.s.6.d.of the whiche number, take $\frac{1}{2}$ which is 11.s.3.d.and substract it from 22.s.6.d.and from 16.s.8.d. and there shall rest 11 s.3.d.and 5.s.5. pence for the two first numbers in the rule of three, and 6.shil.8.pence which is the ouerprice of a hundred of yron for the thirde number, then multiplie and deuide, and you shall finde.3.s.2. pence, $\frac{14}{27}$: and so muche did the hun- of yron coste in readie moneye.

12. More

12. Moze, twoo marchauntes wyll chaunge their marchaundise, the one with the other, the one of them hath sayes of 200 shill. 10 d. the pece to sell foz ready money, and in barter he wil sell the pece foz 21 shillings, and he wyll haue the ¼ in readie money: The other hath cappes of 35 shill. the dosen to sell foz readye money: but he wyll gayne after 10 vppon the 100. I demaunde howe he shall sell the same cappes in barter? Answere, saye, if 100 be wozthe 110: What shall 35. shill. be wozthe, which is the iust pzice of the dosen of cappes? Multiplye and diuide, and you shall fynd 38 shil. 6. d. Then take the ¼ of 25. whiche is 6 sh. 3. d. and subtracte it from 20 shill. 10. d. and from 25. sh. and there shall rest 14 sh. 7. d. & 18 shill. 9. d. foz the two firste numbers in the rule of three, and 38 shill. 6. d. whiche is the iuste pzice with his gaine of the dosen of cappes, foz the thyzd number: then multiplie and diuide, and you shall finde 49.

M.j. shill.

ſhill. 6. d. and for ſo muche ſhall he ſell the doſen of cappes in barter.

¶The 12 Chapter treateth exchaunging of money from one place to another.

FIrſte, you muſte note, that at Andwerpe they vſe to make their accomptes by Deniers de gros, that is to ſaye by pence Flemiſhe, whereof 12 doe make 1 ſhill. Flemiſhe, and 20 ſhil. Flemiſh do make 1 li. de gros.

1. If I deliuer in Flaunders, 500 li. Flemiſhe, at 19 ſhil. 6. de gros that is to ſaye, at 19 s. wil. 6. d. Flemiſh, to receiue 20 ſhil at London: I demaund howe much I ſhall receyue ſterlynge at London for the ſayde 500 li. Flemiſhe? Aunſwere: Saye, yf $19\frac{1}{2}$ gene $\frac{20}{1}$, what wyll $\frac{500}{1}$ gene? Multiplie and diuide, and you ſhal finde 512 li. 16. ſh. 4. d. $\frac{12}{13}$ of pennye. And ſo muche ſterling ſhall I receyue in London for my 500 li. Flemiſhe.

2. If

2. If I deliuer in London 375 li. ſterlyng, to receyue in Andwerpe 21 ſhill. 9. d. de gros, that is to ſaye Flemiſhe, for euery pounde ſterlinge. I demaunde howe many poundes Flemiſhe I ſhall receiue in Andwerpe, for the ſayd 375 pound ſterling?

Anſwere, ſay if $\frac{21}{1}$ giue 21 $\frac{1}{2}$: what will $\frac{375}{1}$ giue? Multiplie and diuide, and you ſhall finde 407. li. So many poundes Flemiſhe ſhall I receyue for the ſayde 375. li. ſterlinge in Andwerpe.

3. If I take vp monie at Andwerpe after 19 ſh. 6 d. Flemiſhe to pay for ỹ ſame at London 20 s. ſter. & when the daye of paiment is come, I am forced to rechaunge the ſame, and to take vp money againe here in London to repay the ſame, ſo that for 20 ſhillings, which I take vp here, I muſt repaye, 19 ſhill. 9. at Andwerpe. I demaunde whether I do winne or loſe, and howe muche vpon the 100 pound of money?

Aunſwere, Saye, if 19 $\frac{1}{4}$ giue 19 $\frac{1}{2}$, what wyll $\frac{100}{1}$ giue?

U. ỹ. Multi-

Multiplie and diuide, and you ſhall finde $98\frac{18}{79}$, the whiche beinge abated from 100 there will remayne $1\frac{21}{79}$. And ſo muche doe I loſe vpon the 100 li. of money.

4. If I take vp at London 20. ſhill. ſter. to paye at Andwerpe 21. ſhill. 8. d. Flemiſhe, and when the day of payment is come. I am conſtrained to take vp money againe at Andwerpe wherewith to repay the forelayde ſumme: and there I doe receyue 22 ſhill. Flemiſhe to paye 20. ſhill. at London. Nowe I demaund whether I do winne or loſſe and howe much vpon the 100 pounde of money after the rate.

Anſwere: ſay, if $21\frac{2}{3}$ giue $\frac{22}{7}$. What wil $\frac{100}{1}$ giue? Multiplie and diuide, and you ſhall finde $101\frac{7}{11}$, from the whiche abate 100, and there will remaine $1\frac{7}{11}$ and ſo muche ſhall I gaine vpon the 100 li. of money.

The exchaunce from London into Fraunce, is not lyke as it is into

to Flaundees but is deliuered by the Frenche crowne, whiche is woꝛth ſo ſouſe Tournois the pece.

And here muſte you note that in Fraunce they make theyꝛ accompte by Deniers Tournoys, wherof 12 maketh one ſouſe Tournois, and 20. ſouſe. Tournois maketh 1. pound Tournois, whiche thei call a Liure, and the Frenche Crowne is currant amonge Marchauntes foꝛ ſi ſouſe Tournois, but by exchaunge it is otherwyſe, foꝛ they wyll deliuer but ſo ſouſe. Tournois, whiche is 2 li. 10 ſouſe. Tournois foꝛ a crowne, oꝛ at ſuche pꝛice as the takers vp of money can agree with the deliuerer. As by Example.

5. If I deliuer 340 pound ſter. here in London after 6. ſhill. 4. d. ſter. the crowne, to receyue at Roan oꝛ at Paris ſo ſouſe Tournois foꝛ euerye crowne, I woulde knowe howe ma-

nyc liures Tournoys I ſhall receiue there for my 340 li. ſter. Aunſwere, ſay if 6 ſh. $\frac{1}{4}$ do giue me 2 li. Tournois what will $\frac{6100}{1}$ ſh. giue (whiche is the 340 li. reduced into ſhillings) multiplie and diuide, & you ſhall finde 2684 Liures $\frac{4}{19}$ whiche is worthe 4. ſhill. $\frac{4}{19}$ Tournois, and ſo much ſhal I receiue in Roan or Paris for my 340 li. ſterl.

6. If I deliuer in Paris or Roan, or els where in Fraunce 1250 liures Tournyis, at 50 ſouſe tournois the crowne, to receyue for euerys ſuche crowne 6 ſhillings 3. d. ſterling at London. I demaunde howe much ſterling money I ſhall receyue at London for my 1250. li. Tournois. Aunſwere: ſaye, if two li. $\frac{1}{2}$ doe giue me 6 ſhillinges $\frac{1}{4}$, what wyll $\frac{1250}{1}$ giue? Multiplis and diuide, and you ſhal finde 3125 ſhyllynges ſterlynge, whiche maketh 156. pounde, fyue ſhillyngs ſterlynge. And ſo many pounds ſhal I receyue at London, for the ſaide

1250

1250 pounde Tournois, after 6 ſhillinges 3 pence for euery crowne.

¶ The 13 Chapter treateth of the Rule of Alligation.

THe Rule of Alligation is ſo named, for that it teacheth to alligate or binde togither diuers percelles of ſundrie prices, and to knowe howe muche you muſte take of euerye perceil, accordynge to the nombers of the Queſtion.

Example.

1 A Goldſmythe hath three ſortes of Golde. The firſte is worth thirtye Crownes the pounde weyghte: The ſecende is worthe 36 Crownes. And the thyrde is worthe 45. crownes, and of theſe three ſortes he will make a Scepter of fiue pound weight, whiche ſhalbe worthe 40, Crownes the pounde. I demaunde howe muche he muſte take of euery ſorte?

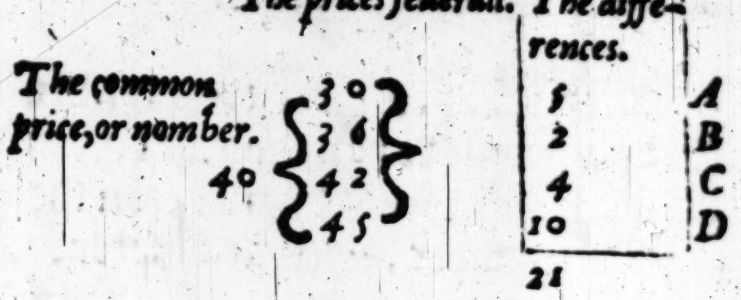
Answere: first you muſt ſet downe the nõbers whereof you wyl make the Alligation (which are 30. 36. 38, and 45) orderly the one vnder the other, as if you ſhoulde make of them an addiciõ: and the common nomber whereunto you will reduce them, ſhall you ſet on the left hand, which common nomber in this example is 40. Then marke what ſummes bee leſſer, then that common nomber, and whiche bee greater, and wyth a draught of your penne, evermore lynke two nombers togither, ſo that the one be leſſer then that common nomber, and the other greater then he. For 2 greater nor twoo ſmaller nombers maye not bee linked together, for they wyll eyther be leſſer, or els greater then the common nomber: but one greater nomber, and one ſmaller maye be ſo mixed, that they will make the common nomber. And two greater or twoo ſmaller nombers, can neuer make the common nomber in dewe order,

as

as here after ſhall appeare.

After that you haue thus lynked them, then make howe muche eche of the leſſer nombers is ſmaller then the common nomber, and that difference ſhall you ſet againſt the greater nombers, whiche bee linked with thoſe ſmaller, eche of them with his matche ſtyll on the righte hande. And lykewiſe you muſte ſet the exceſſe of the greater nombers againſte the leſſer which be combyned with them. Then ſhall you adde all thoſe differences into one ſumme, whiche ſhalbe the firſt nomber in the rule of three, and the ſecond nomber ſhalbe the whole maſſye pece that you will haue of all the perticulers, the thirde ſumme ſhalbe eche difference by it ſelfe, and by them ſhall you finde out the fourth nomber declarynge the iuſte poztion of enerye perticuler in that mixture, as nowe by the fozmer example, I wyll make it plaine.

The



21. .6. .5. || 21. .6. .2.

21. .6. .4. || 21. .6. .10.

Here in this former example, you ſee that I haue ſet downe the ſeuerall prices, whiche be 30, 36. 42. 45, and haue linked together 30, with 45. & 36. with 42. The cõmon price 40, I haue ſet on the lefte ſyde, and the difference of it from euerye ſeuerall price, I haue ſet on the ryght hande, agaynſte that ſumme wyth the whiche it is lynked. So the difference of 30 from 40 is

40 is 10, whiche I ſet againſt 45, that he is lynked wythall, and the difference of 45, aboue 40 is 5. whiche I haue ſet againſt 30.

So lykewayes, the differences of 42 aboue 40, is 2, that I haue ſette againſte 36. And the difference betwen 36 and 40 (whiche is 4) I haue ſette againſte 42. Then I adde all thoſe differences togither and they maks 21, whiche I make the fyrſte nomber in the Rule of three; and 6 the ſeconde nomber, which is the weyght of the Scepter of Golde, and the thyrde nomber ſhall bee euerye perticuler difference. Then I worke by the Rule of three: ſayinge yf 21. (whiche is the differences added together) doe geue me 6 pounde, whiche is the weyghte of the Scepter, what ſhall 5 gyue, whiche is the firſt difference?

Multiplie and diuide, and you ſhall fynde one pounde $\frac{1}{7}$: ſo muche muſte I haue of the fyrſte price.

Then

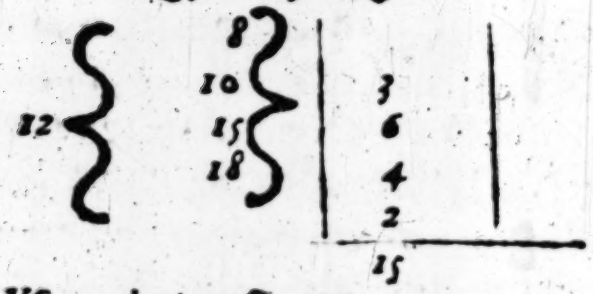
Then doe likewise with the reste and you shall finde $\frac{4}{7}$ of the seconde price, 1 li. $\frac{5}{7}$ of the thirde price, and 2. li. $\frac{6}{7}$ of the fourth, the whiche 4 summes beinge added together, do make 6 li. whiche is the totall that I would haue. And now to proue if the prices do agre, you shall do thus: Firste multiplie this totall summe 6 by the common price 40 and it will make 240 Crownes, whiche you shall kepe be it selfe.

And afterward multiplie every seuerall summe of weight by the price belongynge to the same weyght, and if that same do agree with the first that you kepte by it selfe, then is youre worke well done, as here 1 li. $\frac{3}{7}$ is the weyght of that sorte of golde whiche is of 30 Crownes price. Then multiplie 30. by 1 li. $\frac{2}{7}$, and it maketh 42. crownes, $\frac{6}{7}$, which you shall set downe. Then multiplie $\frac{4}{7}$ (whiche is the weyght of the seconde sorte of golde) by 36, which is the price of the same, & therof cōmeth 20 crownes $\frac{4}{7}$: so again

1 li.

1. $11\frac{1}{7}$ multiplyed by 42, doth make 48 crownes. And laſte of all 2 pounde. $\frac{4}{7}$ multiplied by 45. maketh 128 crownes $\frac{4}{7}$. All theſe added together dothe make 240 crownes, agreable to the former ſumme of 40 multiplied by 6: And thus I maye affirme that this worke is well done.

2. A Tauerner hathe foure ſortes of wine, of foure ſeuerall prices, the firſte of 8 pence the Gallonde, the ſeconde of tenne pence the Gallonde, the third of 15 pence, and the fourth of 18 pence. And he will mingle one pũchen with all theſe ſortes, ſo that the Gallonde ſhalbe worthe but twelfe pence. I demaunde howe many Gallondes he muſte take of euery ſorte? Aunſwere: Firſte ſuppoſe the punchen to holde ſome certayne meaſure, as to contayne 84 Gallondes and then the (ſorme wyll bee after this ſorte, as you ſee here after folowynge.



Yf 15. do giue 18.

VVhat wil 3?
VVhat wil 6?
VVhat wil 4?
VVhat wil 2?
They make
16 4/5 *of the firſt.*
33 1/3 *of the ſeconde*
22 2/5 *of the third.*
11 1/5 *of the fourth.*
84

¶The 14 chapter treateth of the rule of falſhode, or falſe poſitions.

The Rule of falſehod is ſo named not for that it teacheth any deceyte of falſehode, but that by fayned nombers taken at all aduentures, it teacheth to finde out the true nõber that is demaunded. And this (of all the vulgare Rules whiche are in practiſe) is the moſt excellent: this rule hath two parts, the one is of one falſe poſition alone: the other is of two poſitions as here after ſhall appeare.

Thoſe

Those questions whiche are done by false positions, haue theyr operations, in a maner like vnto that of the rule of three, but onely that in the rule of three, we haue three nombers knowen, and here in this rule wee haue but one (I meane that commeth in operation) vnto the likenes whereof we muste diuise two other, the one multiplying, and the other diuidyng, as by example.

I. I haue delinered to a banker a certein summe of pounds in money, to haue of him by the yeare 6 li. vpon the 100 li. And at the ende of 10 yeres he payed me 500 pounde for all bothe principall an gaine. I demaund howe muche was the principall summe that I delinered at the fyrste. Here you see that there are diuers termes: but the chiefe to worke with all is 500 li. whiche commeth of the other nombers, that is to saye, of 10, and 100 for of them is compounde the tenour

of

of the queſtion, the practiſe whereof is thus.

Let vs faine a nomber at pleaſure, and with the ſame let vs make oure diſcourſe, euen as though it were the principall ſumme that we ſeke for. As by Example. Suppoſe that I deliuered hym at the firſte 200 pounde, the whiche were worthe to me in 10 yeares 120 pounde after the rate of 6 vpon the hundred pounde. Then 120 pounde added with 200 pounde. Do make but 320 li. and I muſt haue 500 li. Thus you ſee that I haue three termes for the rule of three: the one which ſhall conteine the Queſtion the other two, which I haue 200, & 320: in ſuch ſorte, that 320, ought to haue ſuche proporcion to 200, as 500 hat vnto the nomber that I ſeeke: that is to ſay, vnto the true principal ſumme, then muſt I haue recourſe vnto the rule of three, after this ſorte, ſaying.

If

If 320. pound become of 200. pounde of howe muche ſhall come 500. pound Multiply 500: by 200. and thei are 100000. the whiche you ſhall diuide by 320. pounde and thereof commeth 312. pounde. $\frac{1}{2}$ whiche is the ſumme that I deliuered at the firſte, and thus, this rule hath ſome congruence with the double rule of three.

2. I haue a Ceſterne with 3. vnegal cockes conteining 60. pipes of water: And if the greateſt cocke bee opened, the water will auoyde cleane in one houre, at the ſeconde yt will auoyde in twoo houres, and at the thirde it will require three houres. Nowe I demande in what ſpace will it auoide, all the cocks beyng ſet open. Suppoſe that it wyll auoide in halfe an houre, that is to ſaie, in 30. minutes. Then muſte there auoide at the firſte cocke, the $\frac{1}{2}$, whiche is thirtie pipes, and by the ſeconde cocke the $\frac{1}{4}$ whiche is 15, pipes, and by the thirde cocke the $\frac{1}{6}$, that is tenne pypes, all the whiche

summes beeyng added together doe make fiftie fiue pipes, but it shoulde be sixtie pipes. Therefore I saie by the rule of three, if fiftie fiue pipes doe voide in thirtie minutes: in how manye minutes will sixtie pipes voide? Multiplie and diuide, and you shall finde thirtie twoo minutes $\frac{32}{55}$. And in that space will the water auoide if all the cockes be set open.

¶ Of the rule of two false positions.

The summe of this rule of two false positions is thus, when any question is proponed appertaining to this rule. First imagine any nũber at your pleasure, which you shal name the first position, and with the same shall you worke in stede of the true number, as the question doth import, and if you see that you haue missed. Then is the last number of ỹ worke either to great or to little, ỹ shal you note for to be the first errour,

in

in the which you haue missed with the signe of more, or lesse, whiche signes shalbe noted with these figures, +:— This figure +: betokeneth more, and this playne line — signifieth lesse, that is to saie the one signifieth to muche & the other to little: then begin again, & take an other number, whiche shal be the second position, and worke by the question as before, if you haue missed againe, note the excesse or want, for that is the seconde errour. Then shall you multiplie the first position by the second errour crossewise, and againe the seconde position by the first errour (and this must alwaies be obserued) & keepe the two products: then if the signes be both like, that is to saie, either both to muche, or both to little, abate the lesser produte frō the greater and likewise, you shall subtract the lesser error from ỹ greater, & by the remaine of those errours, you shal diuide the residue of the products: the quotient shal be the true number that you seeke for.

But if the two signes be vnlyke, that is to say, the one to muche and the other to lyttle, then shall you adde those productes together so shall you also adde bothe the errours together, and by the summe of those errours, diuide the totall summe of both the productes: the quotient shall be likewise the true number that the question seketh, and this is the whole rule, as by example.

3. A man lying at the point of death, saied that he had in a certain Coffer a hundred duckets, the which he bequeathed to 3. of his frends by him named, after this sorte. The first must haue a certain portion, the 2. must haue twise so manie as the first abatyng 8. Duckets, & the third muste haue 3. times so many as the first, lesse by 15 Duckets. Nowe, I demaunde howe many euerie of them must haue. Answere: First I doe imagine that the firste man had thirtie Duckets, then by the order of the question, the seconde shoulde haue fiftie twoo: and the third seuentie fiue.

These

Theſe three ſummes beyng added to-gether doe make 157. and I ſhoulde haue but a hundred: ſoe that this firſte errour is to much by fiftie ſeuen; then I note a parte the firſte poſition thirtie, with hys errour fiftie ſeuen, to muche after this ſorte thirtie. 457.

Therefore I proſecute my worke and I ſuppoſe that the firſte hadde twentie foure, then by the ordre of the queſtion, the ſeconde ſhould haue 40. and the third, fiftie ſeuen, theſe three ſummes beyng added together, doe make 121. and I muſt haue but a hundred, ſo the ſeconde errour, is to muche by 21. Therefore I note 24. 421. vnder the thirtie. 457. as you maye ſee in the margent of the nexte ſide followyng. Then I multiplie croſſewiſes, thirty (which is the firſte poſition) by twelue which is the ſeconde errour, and thereof commeth 630. likewiſe I multiplie twentie and foure (which is the ſeconde poſition) by fiftie ſeuen, whiche is the firſte errour, and I finde 1368. then

because the signes of the errours are bot he like: that is to saye muche, I must therfore substracte 630. from 1368. and ther wil remain 731 which is the diuidende: again I must substract the lesser error from the greater, that is to wit, 21. out of 57. and there will remain 36. whiche shalbee my diuisor. Thys done I diuide 738 by 36 and the quotient will bee 20. $\frac{1}{2}$. The which 20. $\frac{1}{2}$ is the iust number of the duckets that the first man had for his parte, so consequently the seconde manne had thirtie three Duckets, and the thirde fourty six $\frac{1}{2}$, as by proofe in the margent maie appeare.

630

30. + 57.

24. + 21.

1368 . 36.

630.

738.

	11.
	738
20 $\frac{1}{2}$	366.(20. $\frac{1}{2}$
33	3
46 $\frac{1}{2}$.	
100.	

The

The like number wil also appeare. in case the errours wer both to little, as in makyng the twoo positions by 18. and 20. where you shal finde the two errours both to little, the firste will bee to lyttle by 15. and the seconde to little by 3. as by perusing this worke in the margent you shal well perceiue.

54.

18. — 15.

20. — 3.

300 . 12.

54.

246. | ~~1~~46(20.½

~~1~~22

1.

Againe if one of the errours were to muche, and the other to little, yet shall I haue the true number, as before: As if the twoo positions were 24. and 20. I shall finde that the firste errour will be 21. to muche, and the seconde wil be three to little: Therfore I multiplie twentie foure by thirtie, crossewaies, thereof commeth 72.

Likewise I multiplie twentie by 21. the product will be 420: These twoo summes 72. and 420, I adoe both together because ẏ signes of the errours bee vnlyke, and thei mak. 492. the whiche shalbee my diuidende, and againe, I addde the lesser errour three, with the greater errour 21. and they mak 24. for my diuisor, then diuiding foure hundred ninetie two by twenty foure, the quotiet wilbe twentie $\frac{1}{2}$: as in the margent doth plainlie appeare.

72:
24421.
20. −3.
420. −24.
72.
492.

1
~~2~~92(20$\frac{1}{2}$
~~1~~~~4~~~~4~~
2

And now because you shall not forget this parte of the rule, learne thys briefe remembraunce followyng.

The signes both like substraction doe require.
And vnlike signes addition will desire.

The

The meanyng whereof is thus yt both the errours haue lyke ſygnes, then muſte the diuidende and the diuiſor bee made by ſubſtraction, as is taught before, and if thoſe ſygnes bee vnlike, then muſte I by addition gather the diuidende, and the diuiſor, as I haue done in this laſte example.

4. A man hath two ſiluer cups of vnegall waight, bauynge to them bothe, but one couer, the waight whereof is fiue ounces, if the couer be putte to the leſſer cuppe, it wyll bee in double proporcion vnto the waight of the greater, and the couer beeyng put to the greater cuppe, will bee in triple proporcion, vnto the waight of the leſſer. I demaunde what was the waight of euery cuppe.

Suppoſe that the leſſer cuppe dyd waygbe ſeauen ounces, then wyth the couer it muſte waigh twelue, and this waight ſhoulde be in double proporcion vnto the greater, therefore

the greater muste waigh six ounces adde vnto it 5 ounces for ẏ couer, all will be 11. ounces, but it should be 21 for to haue it in triple proportion, vnto 7. which representeth ẏ weght of the lesser cuppe

105.

7.—10.

9.—15.

99 . 5.

105.

90 | 15 (3. oũ.

15 | 5

So that this first errour is to little by 10. which you shall note after seuen in this sorte. 7.—10.

After you shall suppose some other number, as 9. and make the like work as before, so shal you finde 15. to little, for the second errour, which you shall put behind nine, and then worke with the reste as aboue is sayed, and you shall finde that the lesser cuppe wayed three ounces, and consequentlye the greater foure ounces.

5. One man demaunded of another

ther in a mornynge what a clocke it was, the other made hym thys answere, if you dee adde (saieth hee) the $\frac{1}{2}$ of the houres whiche be paste synce mindnight, with the $\frac{1}{3}$ of the houres whiche are to come vntill none, you shall haue the iuste houre, that is to saie, you shall knowe what a clocke it was: Suppose that it was 4 a clocke in the mornynge, so shoulde there remaine 8. vntill none: then I take the $\frac{1}{4}$ of 4. whiche is 1. and the $\frac{1}{3}$ of 8. whiche is 5. $\frac{1}{3}$, and I adde them together, so I finde 6. $\frac{1}{3}$ and I supposed but 4. therfore thys first errour is to muche by 2. $\frac{1}{3}$, which I note after my position thus 4. $\frac{1}{4}$. 2. $\frac{1}{3}$: then againe I suppose an other number, that is to saye nine, soe shoulde remaine but 3. houres vntill none., I take the $\frac{1}{4}$ of 9. and the $\frac{1}{3}$ of 3. whiche is 2. $\frac{1}{4}$ and 2. these I adde together and they make 4. $\frac{1}{4}$: but I supposed that it was 9. therfore the second errour is 4. $\frac{3}{4}$ to little whiche I note behinde my position thus. 9. + 4. $\frac{3}{4}$.

And

And then I multiplie erosse wyse, as before is taught, and bicause the sygnes of the errours are vnlike, that is to saye, the one to muche, and the other to lyttle, therefore in thys woorke I muste adde the products, and they will bee fourtie.

29.
4. 4 2. $\frac{1}{3}$

9. – 4. $\frac{2}{4}$.
21. 7. $\frac{1}{12}$
19.
40.

Likewise I adde the errours, and thei be seuen, $\frac{1}{12}$. Then I diuide fourtie by seuen $\frac{1}{12}$, and thereof commeth fiue houres $\frac{11}{17}$, and that houre it was in the mornyng.

¶ The fiueth Chapiter treateth of sportes, and pastime, done by number.

If you would know the number that any man doth thinke or imagine in hys minde, as though you coulde deuine.

Bydde hym triple the same number, then of the product let hym take the $\frac{1}{2}$

if

if the number be euen, or els the greater halfe, if the same bee odde, then bid him triple againe the saied $\frac{1}{2}$: after say to him that he put awaie, if he can 36. 27. 18. or. 9. from the laste number beyng tripled: that is to saie, cause hym subtellye to put awaie nine as many times as is possible and kepe the number secretly: and when ye can no more take away 9. then to know if that yet there remaine anye number, bid hym abate three and twoo or one, if he can: this doone, see how manie tymes nine you haue caused hym to abate, for the which keepe you in mind so manie tymes 2. and if that you knowe that hee had any thing remaining beside the nines, ẏ same shall also note vnto you 1.

Suppose that he thought 6. whiche beyng tripled is 18. whereof the $\frac{1}{2}$ is 9. the triple of that is 27: now cause hym to abate 18, or 9. or 27. and againe 9: but then he will saie vnto you that he cannot, bid hym then abate 3. or 2. or 1. he wyl saie also that he can not; wher-

fore

fore considering that you have made hym to abate 3. tymes nine iustly, you shall tell him that he thought 6. for 3. tymes 2. maketh 6. If he had thought 5. the triple therof is fiftene, wherfore the greater $\frac{1}{3}$ is 8. the triple of that maketh 24. which conteineth 2. times 9. thei ar worth 4. and the remain signifieth 1. the which added togither make 5. which is the nõber that he thought.

2. If in any companie, one of them hath a ringe vpon his finger, and you woulde know by maner of deuining, who hath the same and vpon what finger and what ioint: cause the persons to sit doune in order, & keepe likewise an order of their fingers: then separate your self from them in some certaine place, and saie vnto one of the lookers on, that hee double the number (marking the order) of hym that hath the ring: and vnto the double bid hym ad 5. and then cause him to multiply this addition by 5 and vnto the product bid hym adde the number of the finger of the

the perſon whiche hath the ring: bee it that the ſame laſt ſum did amounte to 89. then afterward ſay to him ꝑ he put after the ſame laſte number towarde his right hand a figure ſignifyng vpon whiche of the iointes hæ hath the ring. As if it be vpon the third iointe, lette hym put 3. after 89. and it will bee 893: this doen, you ſhal aſke him what number hee keepeth, from the whiche you ſhal abate 250. and you ſhal haue thꝛee figures remainyng at the leaſt. The fyꝛſte towarde youre lefte hande ſhall ſignifie the number of the perſon whiche hath the ring. The ſecond oꝛ middle figure ſhall repꝛeſente the number of the finger. And the laſt figure towarde your right hande, ſhall betoken the number of the ioynte. As if the number whiche hee dyd keepe were 893. from that you ſhall abate 250. and there will remaine 643 Which do note vnto you, that the fꝛſt perſon hath the ringe vpon the fourth finger, and vpon his thirde iointe.

But

But note that when you haue made your subtraction, if there do remaine a cipher in the place of tennes, that is to sate in the seconde place, you muste then abate from that figure whiche is in the place of hundredes, that is to sate from the figure which is next your left hand, & that shalbe worth ten tenthes, signifiyng the tenth finger: as if there shoold remain 703. you must saye that the firte person) vpon his tenth finger and vpon his third ioint) hath the ring

3. And after the same maner, if a man do cast three dice, you maie know the poincts of euery one of them, for if you do cause him to double the poincts of one die, & vnto that double to ad 5. and the same sum to multiplye by 5. & vnto the product ad the poincts of one of the other dice, and behind the number towarde the right hand, to put the figure which signifieth the poictes of ỹ last die, & then shal you aske him what nũber he kepeth [illegible] ỹ which abat 250 & ther will remai[illegible] figures, which do

note

note vnto you the pointes of euery die.

4. Likewise if 3. of your companions, to saie Peter, James, and Jhon, that would (in your absence) giue themselfe euerie one a contrarie name: as for example: Peter woulde be called a king, James a duke, and Jhon a countie: And I woulde deuine whiche of them is called the kinge, whiche the duke, and which the county. Take 24. stones, or other peces whatsoeuer, and geue vnto Peter. 1. vnto James 2. and vnto Jhon. 3. or otherwise. But marke well vnto whiche of them you haue 1. vnto which 2. and vnto whom 3. Then leuing the 18. stones (before them) that are ramaining, you shall absent your selfe from their sighte, or elles tourne your face from them, saiyng thus vnto them, whosoeuer nameth himselfe a kinge: for euerie stone that I gaue him lette hym take one of the residue, and he that nameth hymselfe a duke for euerie stone that I gaue hym lette hym take two of them that remain, and he

that calleth hym selfe a countie, for euerie stone that I gaue hym let, hym take foure, this beyng done approache nere them, and marke howe manye stones are remaynyng: and know this that there can not remaine any other, but one of these fiue, 1, 2, 3, 5, 6, 7, for the whiche fiue numbers we haue chosen to euerie of them a seuerall name, whiche are these: Angeli, Beati, qualiter, Messias, Israel, pietas: eche of them containyng three vowelles, a, e, i, whiche doe shewe the names by order: that is to say, a, sheweth whiche is the king, e, telleth whych is the duke, i, sheweth which is the cõtie: in folowynge the order how, and to whom you haue geuen 1. stone

1	2	1	2	3	3
2	3	3	3	1	2
3	1	2	1	2	1
a	e	a	e	i	i
e	a	i	i	a	e
i	i	e	a	e	a
1	2	3	5	6	7
A	B	Q	M	I	P

ſtone, to which 2. and to which 3. Then there doe remaine but 1 ſtone, the firſt name Augeli (by theſe thræ vowels a, e, i,) ſheweth that Peter is the kinge, James the duke, and Jhon the county. And if there doe remaine 2 ſtones, the ſecond name Beati, ſhall ſhewe you by theſe thræ vowels, e, a, i, that Peter is the duke, James the king, and Jhon the countie. And ſo of the other as by this Table dooeth plainly appeare.

FINIS.

¶ Here beginneth the table of this Booke.

¶ The contentes of the Chapters of the firste parte.

The diffinition of number. fol.1
Numeration in whole number. Fol.eodem Chap.1.
Addition in whole number.ca.1.fo.6.
Substraction. capi.3. fol.9.
Multiplication. capi.4. fol.12.
Diuision. capi.5. fol.21.
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The Rule of thre called the Golden Rule. And the backer Rule, vnto all these is added their proues.ca.7. fo.34

¶ The contentes of the seconde part.

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Du-

Duplation, Triplation, and Quadruplation. ca.8. fol.68
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Rules of practise called briefe rules. capt.1. fol.79.
Rules of three compounde, beyng.4. in number. capt.2. fol.99.
Questions of the trade of Marchaundise. capt.3. fol.101.
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Questions of the reducyng of paumes of Genes into yardes.ca.6. fol.115.
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FINIS.

Geo. Tan [illegible]
No 92 Bartholo[illegible]

John Cooke
Les booke

Sonny

[illegible]